THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

VOL. XI. No. 252—14th YEAR.] LONDON, JUNE 17, 1862. [Subscription per Ann. { 15s. in Advance / 18s Credit.] DOUBLE No. Price 1s.

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FOR GAS, STEAM, AND WATER.
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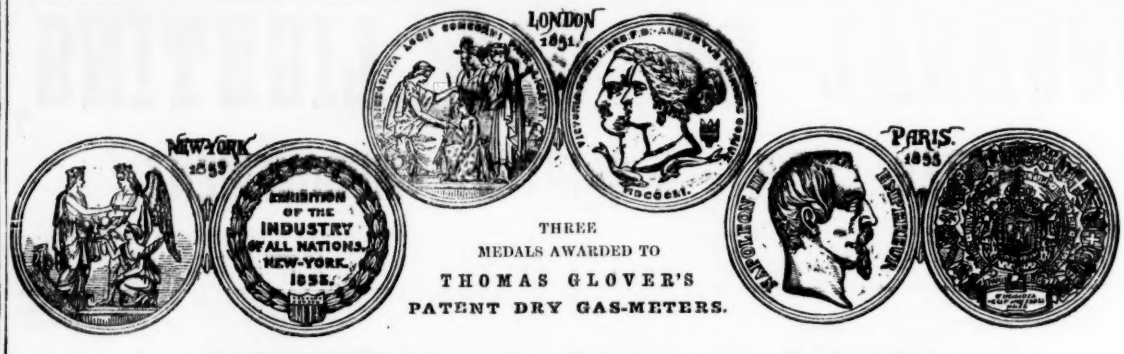

THREE
MEDALS AWARDED TO
THOMAS GLOVER'S
PATENT DRY GAS-METERS.

LORD REDESDALE'S "SALE OF GAS ACT."

DRY METERS *VERSUS* WET METERS.

LONDON, February 25, 1861.

THOMAS GLOVER begs to call the attention of Gas Companies and others to a few *facts*, which, if duly considered, must lead to most important conclusions :—

1. That since THOMAS GLOVER commenced to manufacture his Patent Dry Gas-Meters (which is now upwards of 15 years), every Wet Meter Maker of any importance in England has been compelled to manufacture Dry Gas-Meters ; and in the JOURNAL OF GAS LIGHTING, of date of 12th of February, 1861, Messrs. William Parkinson and Co., successors to the late Samuel Crossley, advertise that they "intend manufacturing *Dry* as well as" Wet Meters, and it is worthy of particular notice that they intend to do so "after 40 years experience in manufacturing Wet Gas-Meters of such a quality that has enabled them, as they say, to maintain a superiority over all other ; and this, be it also particularly noticed, after they had advertised in the JOURNAL OF GAS LIGHTING, January 29, 1861, "their improved low-spouted Gas-Meter with new patent float arrangement, which entirely overcomes the difficulty experienced by ordinary Wet Meter."

2. That it is quite consistent with THOMAS GLOVER'S knowledge that Wet Gas-Meters, called "low-spouted" or "compensating Wet Meters," have already been proved to be incapable of continuous working or registration, and for this reason the manufacturers of these Meters have been induced to seek the repeal of Lord Redesdale's (righteous) Sale of Gas Act.

3. That every year the Patent Dry Gas-Meter manufactured by THOMAS GLOVER has risen in favour with Gas Companies and Gas Consumers, placing him in the proud position of being the largest manufacturer of Gas-Meters in the country.

THOMAS GLOVER guarantees his Patent Dry Gas-Meters to meet all the requirements of the "Sale of Gas Act," to give accurate and unvarying registration with steady lights ; and, from their peculiar construction, cannot be tampered with, and may be fixed in open situations even above or below the level of the lights. They work with less pressure than Wet Meters, and are not affected by the most severe frost.

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WILLIAM PARKINSON AND CO.

(SUCCESSORS TO SAMUEL CROSLEY),

PATENT WET AND DRY GAS-METER MANUFACTURERS, &c.

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Established 1816.

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"It is well known that in Meters constructed so that the valve will close when the water is drawn off to such a point as to render them 3 per cent. slow the lights are liable to be extinguished by the closing of the valve by a sudden increase of pressure. To meet this difficulty, Mr. Pinchbeck has invented an ingenious and simple arrangement by which the action is reversed, and any such increase of pressure, in his Meter, raises the value instead of depressing it. The fact of the improvement having been adopted by Messrs. W. Parkinson and Co. is a sufficient guarantee that it practically and effectually remedies the inconvenience it is designed to meet."—JOURNAL OF GAS LIGHTING.

PATENT IMPROVED DRY METER,

Which W. P. and Co. pledge themselves to manufacture with the same quality of materials and workmanship as in their Wet Meter, thereby giving Gas Companies and others the advantage of procuring a first-rate Dry as well as a Wet Meter, which, hitherto, they have been unable to do.

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TEST GASHOLDERS, EXPERIMENTAL METERS, EXHAUSTER REGULATORS,

MINUTE CLOCKS, PRESSURE GAUGES, PHOTOMETERS, PRESSURE REGISTERS, &c.

CONTENTS.

Notes upon Passing Events:— PAGE
French Writers on London and the International Exhibition . . 387
The Juries of the International Exhibition 388
Mining in France and England 388
Water Supply in French Cities 389
The Suggested Purification of the Upper Thames 389
Circular to Gas Companies:—
The Police and Improvement (Scotland) Bill 390
The Parochial Assessments Bill 390
Mr. Hughes and his Constituents. 390
Mr. Flintoff at Cardiff 391
Right of Gas Companies to lay Pipes in Private Roads—*Selby v. the Crystal Palace District Gas Company* 391
Nomination of Mr. Chubb as Secretary to the Imperial Gas Company 391
The Ottoman Gas Company 391
Communicated Article:—
Gas-Meters: Wet and Dry 391
Correspondence:—
Remarks on Clay Retorts and Exhausters 393
Leakage from Gas-Mains. 393
Register of New Patents:—
Smith, G.—Improvements in Gas-Meters 394
Lane, D.—Improvements in Apparatus whereby to Regulate the Passage or Flow of Gas, Water, or other Fluids 394
Applications for Letters Patent 394
Grants of Provisional Protection 394
Notices to Proceed 394
Parliamentary Intelligence:—
Progress of Bills in House of Lords 395
Progress of Bills in House of Commons 395
House of Lords Committee—
Leeds Water Bill. 395
Legal Intelligence:—
Court of Chancery—Selby *v.* the Crystal Palace District Gas Company 398
Miscellaneous News:—
Metropolis Gas Supply—City of London Court of Sewers 402
The Gas Explosion in Shoreditch—Inquest on the Body of Hannah Smith 402
Westminster District Board of Works—Mr. Hughes and his Constituents 404
Dr. J. Northcote Vinen's Report on the Gas Supplied by the Surrey Consumers Company 406
Gas Stealing at Knottingley 407
The American Petroleum Oils 407
Wide Estimating 407
Price Current 407

TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

NOTICES.

The subscription is 15*s.* per annum, if paid in advance during the month of January, or 18*s.* credit, in two sums of 9*s.* each, in July and January of each year. Post-Office orders must be made payable at the Charing-Cross Money-Order Office, to William H. Bennett, No. 42, Parliament Street, Westminster.

The next number will be published on Tuesday, July 1, and the subsequent numbers on each successive alternate Tuesday.

Stamped copies, when forwarded by post, must be folded so as to expose the stamp; they are otherwise liable to the full postage charge for letters.

This JOURNAL has been duly registered at the General Post Office for transmission abroad.

All Communications to be addressed to the Editor, No. 42, Parliament Street, Westminster; and orders for Advertisements to the Publisher, Mr. W. B. King, No. 11, Bolt Court, Fleet Street.

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, JUNE 17, 1862.

Notes upon Passing Events.

"BUT what has this"—writes a correspondent, who seems all for business—touching a certain section of our "Notes,"—"to do with 'Gas, Water, or Sanitary Improvement?'" Nothing at all! It is our object, in these "Notes," to amuse, and, if possible, instruct, our readers with information not unacceptable as an addition to the useful, but serious, business department, compressed in smaller type. We do not, however, expect to exercise, in matters out of our speciality, any influence, except the influence which opportune facts and arguments must always have amongst readers and thinkers. With this apology, which will, it is to be hoped, suffice for a long time, we will proceed to our "Notes."

The opening of the International Exhibition has drawn over a crowd of French writers, of all degrees of ability, information, and ignorance. As usual, the ignorant have made the most sensation—a circumstance not complimentary to the range of reading of the writers in our daily papers. As we have before observed, there are Frenchmen to answer Frenchmen on every important question connected with England. The blunders of M. Assolant are not more comic than those of many an English penny-a-liner who, innocent of any language but his own, has contributed to obscure newspapers, after a fortnight's residence, his notions of Paris and the French nation. But, in this country, such literary mountebanks never get a place in any journal of influence and respectability. In France, on the contrary, it is the anxious wish of the Government to reconcile the people to their political condition, and one way of doing this is to encourage caricatures of England and the English social condition, as a counterpoise to the books and essays of writers who take a favourable view of our social position, and who are generally identified with parties not now in power. After all, if we desire to read a brilliant sketch of an English parliamentary debate, we can turn to Montalembert; of English constitutional liberty, to the *mémoires* of De Tocqueville; of our manners and amusements, to Esquiros. One of the best histories of our finance and commercial legislation has been written by Cochut—admirable descriptions of the progress of our agriculture, by Lavergne and Barral; and it is only in works by Frenchmen that the fullest modern accounts of our mining and metallurgic industry are to be found. Month by month, the proceedings of our scientific and literary societies are watched and recorded in French journals; translations of English works form almost as important a part of French publication as of French plays in English theatres. By educated Frenchmen, England is appreciated, if not loved; it is very difficult to love a nation which is always so successful, both abroad and at home. Unfortunately, in France, the educated are a class apart from the mass of the people. In England, where social distinctions are much more marked, the literature of newspapers and cheap periodicals spreads every kind of information, and equalizes every kind of popular knowledge. The extracts from the best articles in the leading newspapers and periodicals find their way into the reading-rooms and public-houses of the lowest streets and the meanest villages. But in France, few below the rank of broadcloth ever see or hear of articles in the *Débats*, *Revue de Deux Mondes*, *Revue Contemporaine*, or *Correspondant*.

Amazing errors occasionally occur even in first-class French political journals. For instance, the Frenchman who, under the English name of John Wilks, supplies the *Constitutionnel* with letters on finance, has lately devoted an article to Canada, in which he states that the customs duties of that colony produce only a nominal revenue, because the Imperial Government has insisted that English goods shall be admitted free, and he calls for Samuel Laing to reform the finances of Canada as he has reformed those of India, with a 10 per cent. on importation—evidently unaware, for the article is very fairly written, that the Home Government has no more control over the customs duties or any other taxes in Canada, than over those of Algeria, and that English manufacturers are taxed, not 10, but from 15 to 25 per cent.—a grievance which led the Manchester School, not long since, to suggest the annexation of Canada to the dominions of their Federalist friends; and, in an extremely able article on corn and bread, in the May number of the *Revue Contemporaine*, the writer asserts that, since the repeal of the Corn-laws, arable land has, to a considerable extent, been turned into pastures—the exact reverse being the true state of the case as regards England.

The extraordinary prejudice of the French mind against a free exchange in commerce, is shown in almost all the articles in the Paris papers on the International Exhibition. Even the correspondent of that old free-trade organ, the *Journal des Débats*, speaks continually of the Exhibition, not as an International Exchange or World's Fair, as the Americans aptly called it, but as a "duel," a "pitched battle" between the manufacturers of England and Europe; and, he bitterly reproaches the French iron, and cotton, and other manufacturers, for not having accepted "the wager of battle." The complaint that France had not space enough allotted to her is answered by his own statement, that several Parisian manufacturers make a greater display than any one English firm. We believe that there is scarcely a single good thing in the French Exhibition that has not found a purchaser, or been the

source of large orders. Of the common ornaments that fill the inferior shops of the Palais Royal, and the arcades of Paris, there are more than enough. We must confess that such forced productions as the *Gobelins* tapestry, painful imitations of fine pictures, interest us but little; but, it is a great pleasure to find truly original designs brought within such moderate prices as in the large statues in zinc imitations of bronze, in which fine designs are adopted to useful purposes. There are a pair of warriors, in gothic armour, of life-size, suited to hold aloft a pair of lamps or gas *flambleaux*, in a great hall, wonderful for vigour and expression—an immense advance on the old conventional negro or Hymen torch-bearers. We commend to the notice of this artist the scene in the *Legend of Montrose*, where Highlanders, sword in hand, were pitted against silver candlesticks; only hoping that he will go for his costumes to the Duke of Hamilton, cousin of his Emperor, and not to the opera. Amongst the jewellery, there is a crown in gold and silver *repoussé* work, presented to Jasmin, the barber-poet, by his townsmen, which is well worth the attention of ladies tired of the old vulgarized patterns of diadems and coronets. One entirely new material in the French courts, the Algerian onyx marble, is so beautiful and useful, that if it can be delivered in quantity at a reasonable price, that is, the price of fine marble, it cannot fail to have a great sale here. It seems equally suitable for the frames of mirrors and balustrades of *boudoirs*. In one very interesting department of the French quarter, are displayed plans and sections of the public improvements on which the Imperial Government has not unwisely expended so much money. The improvements of Paris are shown on a large model. The works of the artesian well, at Passy, are illustrated by a section, in which all the strata pierced are displayed. Close at hand are the tools used by M. Kind, the engineer, in this wearisome but successful operation. There is also a fine collection of models of dock harbours and lighthouses of France and its colonies, including the latest possession—New Caledonia.

The farce of selecting meritorious works, in preparation for distributing the international medals, is being played with more than ordinary absurdity. The juries flit about their respective classes, looking for something new, as Diogenes looked for an honest man; and, when the hour of consultation arrives, the story of the Tower of Babel is revived—great is the confusion between foreigners who know no English, and Englishmen who have forgotten most of their little French. The foreign jurors include many able, first-class men, and all are zealous advocates—"My country, right or wrong," seems the fixed axiom. The English jurors who act, are, for the most part, obscure busy-bodies. Few, if any, of the eminent men whose names adorn what may be called the programme of the Exhibition, attend. They know that these pretended inquiries and comparisons are a sheer waste of time. The display of machinery of every kind is magnificent, but the value of each machine must be taken on trust. The commissioners are acting on the principle of those schoolmasters who bestow a prize, of one kind or another, on every boy, and especially on the boys whose fathers are generous with their game and poultry. What are jurors sent here for, at great expense, unless to support the claims of their own countrymen? For our own parts, as foreigners believe in prizes, we hope it may be so arranged that every foreign exhibitor may get one.

The Minister of Public Works has recently published a report on the statistical results of the working of mines in France, which gives a fund of valuable information. In 1859, the produce of the French coal-mines, derived from 71 districts, or basins, only amounted to one-half the consumption; and although there are upwards of 1400 mines worked, a very large quantity of cast iron, bar iron, and a great number of machines are imported. As to lead, copper, and zinc, official statistics show, that for them France is almost entirely dependent on importation. The value of the minerals other than iron, extracted from French mines, has never much exceeded 3½ million francs, while the importation of these metals has amounted to upwards of 60 million francs, and the total importation, exclusive of gold and silver, to upwards of 100 million francs. And yet there are writers weak enough, or dishonest enough, to pretend that modern France can dispense with foreign trade, and to plume themselves on this purely imaginary superiority to Great Britain. No civilized community of modern days is independent of foreign commerce. To be independent means to retreat to barbarism, to be ill-fed, ill-clothed, and consequently ill-paid. A French shipowner has lately been making a vigorous attack on the taxes on timber, and on ships built abroad and registered in France. He shows, that what is intended to protect French interests, is really a tax in favour of foreign tonnage.

A party of French mining engineers made, last year, a journey through the coal districts of England and Wales. M. Barral, in the *Revue Scientifique*, of June 1, mentions that they travelled through the coal-basins of Lancashire, Northumberland, Durham, Staffordshire, and Wales. They were much struck with the advantageous conditions, the regularity, purity, and favourable inclinations of the strata. "Like all engineers who have previously written about the English mines, they say that, although the French mines are generally worked more scientifically, the natural condition of the English mines gives us great advantages; and they fear that the competition of England will restrict the sale of French coal to a very limited circle." As a consolation, the reviewer observes that the French miner has protection, in the shape of the cost of transport—not less than 10 francs a ton; and also in the very moderate profit—not more than 10d. a ton—with which the English coal-miner is satisfied. "In the English mines, it seems as if everything was sacrificed to economy and cheap production, a principle which, in fact, generally characterizes English manufacturers." "In England, the State has not, as in France, a property in mines. They belong to the owner of the soil. The State receives no payment from coal-mining companies, and exercises no control over them, except by inspectors, whose only duty is to see that the lives and health of the miners are not endangered by the system of working." The English working miners, observes M.M. De Bracquement and De Milly, are remarkable for the zeal with which they perform the work they undertake, and for carrying out the most insignificant duties with scrupulous punctuality. "They are truly drilled to industry; and, it must be confessed, they are very superior when compared with our men." "At the same time, the progress in mining in England during the last ten years is much less remarkable than in France; and it is only just to observe that, if we have seen in England much that was new and usefully applicable to our mines, English mining engineers have also something to learn from studying the working of French coal-mines."

A very curious and characteristic contest has arisen in France between the senders of goods and the railroad companies. In England, we have suffered—or, rather, shareholders have suffered—severely, from waste of capital in needless, or apparently needless, competition. In France, railroads are planned by the supposed superior wisdom of authority, and expressly devised to accommodate traffic, and to pay a good dividend. In England, if a great traffic is obstructed by heavy railway charges, there is an endeavour to raise a capital for a branch, or to bring in some rival invading company. In France, all that the aggrieved can do, is to draw up a report, and appeal to the Minister of Public Works. Even a public meeting, to complain and arrange an agitation, is unlawful. The "Industrial Association of Amiens" has taken up the question of railroad tariffs, and published a report, in which we find the following curious paragraphs: "The railroad companies," says M. Vulfran, "rule over every one and everything with their complicated tariffs; they crush all competition; they absolutely control the progress of manufactures, which they make or mar by the stroke of a pen. By mutual alliances, they destroy or neutralize the geographical advantages of certain districts; they even make treaties with foreign railroad commissioners, and afford foreign countries advantages they refuse to French commerce. . . . The tariffs of the railroads are arranged with the express view of bringing everything upon the lines—[a curious complaint against a matter of course]—without any regard to the good or ill effects of the charges or the localities traversed. In order to destroy the competition of the coasting trade to foreign countries (*grand cabotage*), and to attract as much merchandize as possible, whether foreign or French, the companies adopt exceptional tariffs (*tarifs de détournement*), and favour foreign manufacturers and trade at the expense of French interests." This means, we presume, that they attract goods to the ports where they have stations, from ports like St. Valery, for instance, where they have none. The Amiens Society quotes, in support of these statements, several instances: "For fifteen years, the river-boat trade has been sinking under a ruinous competition. The white wines of 'l'Ile de Rhé,' and 'l'Ile d'Oleron,' used for making vinegar, pay less

for conveyance from Nantes to Paris than from Nantes to Orleans; and the vinegars of Orleans have been charged with an additional 4 francs per barrel. Thus the manufacture of vinegar, which has been established in Orleans for centuries, has been nearly destroyed, and transplanted to Paris, where it daily increases. Soap between Calais and Breteuil, as against Amiens and Breteuil; cast iron between Calais and Paris, against importations by St. Valery and Amiens, and linens conveyed from Dunkerque are all favoured. Goods, sent from Stuttgard or Elberfield to Havre, cost less than similar goods sent by French manufacturers from Strasbourg or Metz. . . In conclusion," says M. Mollet, one of the reporters, "if steps are not taken to arrest the railroad companies in the course they are pursuing, so fatal to French interests of every kind, we shall learn some day that the Northern and Western Companies have made international treaties with the English South Coast and South-Eastern Companies, under which we shall have English manufactures brought from London at a cheaper rate than similar goods from Lille, Amiens, Havre, or Rouen." The reporters do not seem to see that such treaties would also insure the conveyance of French manufactures to London and Liverpool at the lowest possible rates. But this is a domestic quarrel, to which we only refer for the instruction of Mr. Chadwick and the Government interference school, who are always holding up French railway management as a model of perfection. Of course, the report ends with a cry for Government protection: that is to say, the Government is to compel the railroad companies to raise their charges, in order to exclude traffic. We have had, in this country, the same cries of distress from canal shareholders, and owners of colliers and coasters; but our governing classes know that we must take the discount of drawback with the advantages of every improvement. There are pastures round London that let for less than in the days when fat stock walked to Smithfield, and had to recruit before being sent to market.

The society from whose transactions we have already quoted has also considered an important local question—the water supply of Amiens. This city is badly supplied with water, having only 35 *litres* per head as compared with 95, the supply of London. Of this small quantity, a large portion is applied to public and manufacturing uses, so that the inhabitants really have only 16 *litres* for domestic use. London, and most of the towns of the United Kingdom, have a great advantage over continental cities like Rome and Marseilles, where the nominal supply is much larger. Our water companies take the water into the upper floors of houses, and even into most of the cottages of the labouring classes. On the Continent, a second labour has been performed in carrying the water from the fountains and conduits by hand to each house. Amiens has many abundant fountains, and has close at hand several rivers and streams. The river Somme flows through it, and the Avre and Selle unite with the Somme at the gates of Amiens. The Amiens committee, composed probably of scientific amateurs, have reported in favour of collecting a water supply from springs rather than rivers, because "it has the great advantage that it can be supplied to all by public fountains, always soft and limpid, fit to be drunk without being filtered at a temperature of from 10° to 12°, which makes it seem warm in winter and cold in summer." M. Alfred Caillaux, of the *Revue Scientifique*, observes, that "this is the grand argument which has caused the authorities to select the springs of Champagne for the supply of Paris, instead of the Seine, contrary to the advice of a great number of competent persons." M. Caillaux then proceeds to examine the truth of this assumption, and gives the following extracts from the memoranda of Inspector-General Poirée:—"Arcueil furnishes Paris with the purest spring-water. It is conveyed by covered conduits to the Observatory, and thence to the Pantheon; at both these points, it branches off for distribution." The following is a record of its temperature as compared with the Seine water, &c.:—"On the 29th of August, 1857, the temperature was 36° in the shade, 56° in the sun. The temperature of the Arcueil water at its source was 12·2°; at a distance of 12 kilomètres it was 13°; at 1200 mètres, in the subterranean reservoir of the Pantheon, 18°; in the reservoir of Estrapade, 20°; at the stand-cocks of the Polytechnic School, from 19° to 20°. At the same time, the drawing fountains of the Ourcq and Seine water were 20° to 22°, while the river Seine marked 25°. At Havre, spring-waters increased in temperature at the rate of 1° per kilomètre, until at the fountains it reached 17°; the temperature of the sea being 20°. The fountains of Rome show the same results—thus proving that it is a delusion to expect to deliver water of the temperature of a distant source." "In this instance, and, as in every practical matter," says M. Aristide Dumont, a French engineer, "promises of utopian perfection must be distrusted; they invariably form false premises on which it is impossible to reason satisfactorily. Whatever be the temperature of the water as it flows from the soil, it will only be those who can employ refrigerating expedients who will be able to obtain cold water in summer. Working men, who cannot fetch water from the spring, will have to be content with the ordinary temperature. "The really important points to be studied are quantity and quality." "They are the true questions, and others lead to the adoption of magnificent projects, which, after all, will seldom be found to be the best." The Amiens Association have also turned their attention to a project for procuring a water supply from artesian wells. M. Caillaux observes, that "*the example of Paris is not encouraging.*" "It is possible that good soft potable water may be obtained from the green sand, but the uncertainty of such operations suggests the propriety of not entering on them without the greatest circumspection. The water of the artesian well at Passy has, on flowing from the pipe, a most abominable sulphurous smell, which, if not positively injurious, is at any rate disgusting; and the quantity varies materially, having fallen from the 25,000 cubic mètres per diem, with which it commenced, to 6000 and 14,000. Besides, so speculative an undertaking is not consistent with the supply of a necessity of life, which ought to be founded on facts as clear as the sun at noonday."

When is the issue of commissions of inquiry to end? Really the talent some people have for cutting out work for themselves is amazing. The fine Roman hand of Mr. Robert Rawlinson is clearly seen in the following memorial which was presented to Sir George Grey, last Tuesday week, duly signed in the way that all well-managed memorials are signed, by great names in some position or of scientific reputation. We foresee a commission: we trust it is not already cut and dry, and that if it does issue the names of the engineers of the City of London, and Metropolitan Board of Works, and one or two others of acknowledged reputation in water supply, will not be excluded:—

1. Whereas the area of the Thames and its tributaries may be computed to contain 6000 square miles, and extends over parts of the several counties of Essex, Kent, Middlesex, Surrey, Hants, Berks, Wilts, Oxon, Bucks, Herts, Warwick, Northampton, and Bedford.

2. Whereas it is highly expedient to regulate the waters brought down by the river Thames, so that they shall be as fit for use and as little contaminated as may be, both in the district immediately above London and in the neighbourhood of all towns on its banks.

3. Whereas no systematic provision has as yet been made either for regulating the several branches of the waters in the Thames basin on a common plan, or for deterring the towns on the several parts of it from casting their sewage into the streams; and whereas many towns situated above the metropolis, viz., Richmond, Staines, Windsor, Maidenhead, Henley, Reading, and Oxford, do so cast in the whole or parts of their sewage.

4. Whereas, it is admitted that, besides the injurious pollution of the waters, *waste accrues from the loss of sewage.*

5. Whereas, the unregulated action of floods inflicts damage on many lands adjoining the river, and is injurious to the health of the district.

6. Whereas, it is certain that these evils would be greatly abated, and the public health improved, by a more complete and systematized management of outfalls, dams, and sewers than is at present possible.

7. Whereas, also, a report on the Thames basin, with reference to these several particulars, would establish principles applicable to other river systems, and, besides improving the water supply of the metropolis, would yield much information bearing upon the public health, and of service to the nation at large, and may properly be, therefore, esteemed a national object.

The undersigned solicit the Government to *issue a commission of inquiry*, or to cause full inquiry to be made, in such way as they may see fit, into the condition of the Thames and its tributaries (the immediate district of the metropolis being excepted from such inquiry, as already under special jurisdiction); to inquire what defects exist, and to report what remedies can be applied to such defects; having regard generally to all purposes by which the river and its branches, or lands adjoining to them, may be improved; but specially to the purification of the Thames waters for the use of the metropolis and of towns in the Thames district, as well as the amendment of the health of the population which adjoins them.

Circular to Gas Companies.

THE more time that is allowed for the consideration of the Police and Improvement (Scotland) Bill, the more pernicious to gas interests do those clauses appear that have been introduced for the purpose of authorizing the commissioners to purchase or lease the works of existing companies and to take upon themselves the supply of gas. If those clauses be allowed to remain in the Bill, the commissioners will not only be empowered to supply gas, but, by clause 235, they will be able "to manufacture and sell gas-fittings, tubes, meters,

pipes, and all other articles and things in any way connected with gas-works, or with the supply of gas to the consumers thereof, in such manner as the commissioners may think proper." The principle of legislation formerly established—not to allow municipal bodies to become traders in a manufactured article—was first violated by the Manchester Gas Act of 1824; and, if commissioners are permitted to set up factories and workshops for the manufacture and sale of gas-meters, gas-fittings, and of other articles connected with the sale of gas, why should not they be authorized to establish breweries, distilleries, and factories for all articles of general consumption? The manufacturers of gas apparatus throughout the country have taken alarm at the threatened competition by public bodies, backed by funds derived from rates, with power to make up any loss they may sustain out of an especial gas-rate at 9d. in the pound. The manufacturers of London, Edinburgh, and Birmingham, have, we are informed, met and adopted petitions against those clauses of the Bill that relate to the manufacture and supply of gas, especially against the clause that would empower the commissioners to manufacture meters and gas-fittings. The petition from the brass-founders, gas-meter, and fittings manufacturers of Edinburgh thus forcibly sums up the objections to that clause:—"That the powers thus sought, by which private boards, supported by assessments, might be enabled to maintain a competition ruinous to private manufacturers, are contrary to sound policy, and would necessarily be in the end injurious not only to the manufacturers more immediately affected, but also to the general public."

The Bill stood in the orders of the day for consideration last night, but, being low down in the list, it would probably be adjourned to this day at a morning sitting. Mr. A. Black, the member for Edinburgh, has given notice of a motion that the introduced clauses, from 230 to 242 inclusive, be omitted; and we trust that all the friends of private enterprise, and of the rights of property, will rally around him to defeat this insidious attempt in a public Bill to promote a system of centralization, which, if carried out to its full extent, would end in the destruction of private industry. The very questionable example of Manchester, often adduced to show the advantage of vesting the supply of gas in a public body, is by no means a fair illustration of the effect of such a system under the conditions in which alone it could now be carried into operation. In 1824, when power was granted to the commissioners of that town to manufacture and supply gas, gas lighting was so little advanced, that the then existing gas-works to be purchased were insignificant in extent, and cost a comparatively small sum. The police commissioners, as the use of gas extended, constructed their works partly out of profits and partly with money borrowed on the security of the gas-rents, and they thus possessed, in the commencement of their operations, some advantages over a private company whose capital had been expended on its works. Neither could they be successfully opposed, and they were, consequently, saved the useless expenditure that most gas companies have been exposed to in struggling against rivals. Nothing, indeed, could be more favourable to success than the circumstances under which the public authorities of Manchester commenced to manufacture and supply gas; yet, notwithstanding these important advantages, the condition of gas supply in that town has, it is well known, been much less favourable to the consumers than in the neighbouring town of Liverpool, which is, in all respects, similarly situated for obtaining the raw materials. During the first twenty years after the passing of the Manchester Gas Act, the consumers in that town were so much dissatisfied, that it became a question whether the gas-works should be permanently vested in the local authorities; and it was not until after the powers of the commissioners had been transferred to the corporation, and the management of the gas-works had been placed under the able direction of Mr. Shuttleworth, that it was determined to continue the supply of gas in the hands of the public authorities. The price in Manchester, up to that period, had been 10s. 6d. per 1000 feet, and its reduction to 6s. failed to satisfy the consumers, for they knew that, at Liverpool, the company charged much less. In an article on the Manchester system of gas supply, in our JOURNAL of Oct. 8, 1861, we entered fully into a comparison of the advantages and disadvantages of supplying gas by public authorities, in which we proved, by comparison with neighbouring towns, that the balance was strongly in favour of a supply by private enterprise. We reproduce from that article the following summary of our observations on that point, which have a direct bearing on the present question:—

> We have shown that the supply of gas by local authorities, under the most favourable circumstances, has failed to give satisfaction to the consumers, and has not been economically successful; but, even assuming the case to have been otherwise, it would be impossible now to imitate the example of Manchester with advantage. Thirty-seven years have entirely changed the position of gas lighting throughout the country. Gas-works have been constructed, principally by private enterprise, in nearly every city, town, and village of sufficient size to maintain such establishments. Vested rights and interests have been acquired, the purchase of which must be the first step towards carrying the Manchester system into operation, and such interests can only be purchased by paying the owners premiums ranging as high as 150 per cent. on the capital expended.

It has been customary to boast of the town improvements effected in Manchester with money appropriated to that purpose out of gas profits; but the whole of the money so expended has been extracted from the pockets of the gas consumers. The sum total from that source applied to town improvements would not equal the excess of price paid for gas compared with that paid during the same period in Liverpool. Experience proves that the consumers of gas are uniformly supplied by companies at a lower rate than by public authorities under similar circumstances. The fear of competition will always urge the former to keep down the prices to the lowest remunerative rate, while the latter having no such dread become monopolists in the most aggravated sense of the word. The attempt to obtain parliamentary sanction for a system of gas supply that cannot be of any practical benefit, while it directly tends to discourage private trading and individual enterprise, ought to be as strongly opposed as time permits during the progress of the Bill through Parliament.

The Parochial Assessments Bill, as amended by the Select Committee, has been reported and printed. The whole has undergone considerable modification since its first introduction, and the clause for altering the principle of assessment by assessing all property at its rack-rent has been withdrawn. The Bill is now simply one for providing new machinery for working the existing law, and we believe the railway and canal interests are satisfied with it, and have withdrawn their opposition to it.

We have on former occasions condoled with Mr. Hughes on the ingratitude he has experienced from the metropolitan vestries and district boards, more especially from his own, after his long and arduous labours in obtaining the Metropolis Gas Act, 1860. But all previous instances of neglect have been surpassed by his defeat on Friday last, as a candidate for re-election as member of the Metropolitan Board of Works for the Westminster district. This may be considered as the final collapse of the great metropolis gas agitation. A full history of that agitation has yet to be written, as a warning to gas consumers, to gas companies, and to gas agitators. It will exhibit the circumstances under which the districting arrangements were commenced and completed; it will show the groundless alarm that they occasioned; the false rumours of oppression, which gave countenance to that alarm; and the meetings of vestries to oppose the proceedings of the companies; it will expose the violence of parish agitators in attempting to obtain parliamentary interference; it will show how the charges against the companies vanished during the parliamentary inquiry; how those agitators, who, at the first, were most violent in their declamations, gradually retired from the scene as their accusations proved to be unfounded; and how, from the midst of the turmoil, Mr. Hughes came to the surface, and by persevering and undaunted energy remained there till the Metropolis Gas Act of 1860, was an accomplished fact. The history will further relate, how that Act disappointed the expectations of the agitators; how it confirmed the districting arrangements which had excited their animosity, and established the price that had been previously charged. It will show how Mr. Hughes assiduously laboured to obtain these results, as well as the regulation of the monopoly that was sanctioned by the Act. We never failed, during the course of those proceedings, to animadvert strongly on the conduct of Mr. Hughes, in endeavouring to prejudice the public mind against the gas companies; but, we did justice to the zeal and ability with which he supported the cause of his clients. The return he has met with is such as might have been expected, and should serve as a warning to all who may be inclined to tread in his steps. The alleged grievances complained of were proved on examination to have no foundation, and the deceived and disappointed vestrymen failed to perceive in the fair regulations of the Act any recompense for the money they have advanced in obtaining it, or to appreciate the services of

those who had devoted their time and labour to that object. It was not on that ground, however, that the Westminster District Board founded their objection to Mr. Hughes's re-election, as their representative, to the Metropolitan Board of Works. Mr. Bigg, who moved that Mr. Taverner J. Miller, M.P. be elected the representative of the Board, instead of Mr. Hughes, urged, as his objection to that gentleman, that it was very unbecoming for any one elected to fill a public office, to make a claim for pecuniary reward on account of the services he performed. The pecuniary reward to which Mr. Bigg referred, was the sum of £233. 15s. for professional services rendered by Mr. Hughes, in reference to the appeal of the Chartered Gas Company against an increased assessment, at the time that he was member of the Board. A very angry personal discussion, damaging to Mr. Hughes, took place at the meeting, and he ultimately lost his election by a majority of 17. Mr. Miller is M.P. for Colchester, and is a man of high standing and position in the parish.

The collapse of the metropolis gas agitation has, however, operated most unjustly on Mr. Wyatt, the agent employed to carry the Metropolis Gas Bill through Parliament. By a clause introduced into the Bill, it was provided that the Metropolitan Board of Works should pay the expenses of obtaining the Act. Of course, it was intended that the bill of the parliamentary agent should be paid; but legal difficulties have arisen which have hitherto prevented him from obtaining his due. The Metropolitan Board, under the advice of counsel, refuse to pay any but the parties who employed him; and the Court of Common Pleas have supported that refusal. The parties who ought to make the demand have hitherto hesitated to do so, as the payment of the bill might cause an increase of the rates; and thus Mr. Wyatt is kept without his money. This is an act of injustice that ought not to continue; and, now that the irritation against Mr. Hughes has been appeased, it is to be hoped that the vestries and district boards will cease to act in so perverse a manner.

Our old acquaintance, Mr. Flintoff, has been lecturing at Cardiff, in his usual manner, endeavouring to prove that gas ought to be sold in that town for 2s. 6d. per 1000 feet. England, Ireland, and Scotland, we presume, have been used up, and now he is trying his fortunes in the Principality, where he is boasting, as usual, of his great successes in other parts of the kingdom, abusing the existing gas company, and urging the formation of another. As Ireland and Scotland, where there appeared some field for his labours, have proved obdurate to his eloquence, we do not think there is any chance of success for him in Wales; and we shall probably next hear of him in America, where the high price of gas offers him a strong inducement to cross the Atlantic.

A question affecting the right of occupiers of premises abutting on private roads to the use of the subsoil of such roads for the construction of sewers, or for laying down pipes for the supply of gas and water, has been raised in the case of *Selby v. the Crystal Palace District Gas Company*, a full report of which we gave on the 25th of March last, when the matter was before the Master of the Rolls, and whose judgment has been subsequently confirmed by the Lords Justices, as reported at length in our present issue. In this particular case, as the freeholders, who were the plaintiffs in the cause, had covenanted that the occupiers of premises erected on the property should have the same use and enjoyment of the private roads as if they were public roads, it was held that, as the gas company had laid down their pipes at the request of the occupiers of the houses, and would have been entitled to lay them down if the roads were public roads, the pipes had been lawfully laid, and the bill to restrain the company from further breaking up the roads, and to oblige them to take up the pipes again, was dismissed. Any other decision would have been repugnant alike to justice and common sense.

It has been announced that the directors of the Imperial Gas Company have appointed Mr. Harry Chubb, the present secretary and manager of the North London Railway Company, to succeed the late Mr. Alexander Henry in the responsible office of secretary to their influential company. Mr. Chubb enjoys the reputation of being an able and experienced officer, possessing considerable administrative talents, and giving promise of sustaining with credit the reputation established by his predecessor.

A prospectus has been issued for the formation of a company, constituted with an influential and experienced directorate, under the title of the Ottoman Gas Company, with a capital of £50,000, in £10 shares, for lighting Smyrna with gas. This city has long taken the lead as the largest trading city in the Turkish empire, and the principal commercial port in the Levant. Its population is estimated at upwards of 150,000, and its commerce will be largely augmented when the railway, now in course of construction, is finished. The concession is for forty years; and the prices to be charged for gas will, no doubt, be found highly remunerative, as English gas-coals can be delivered at a moderate rate, and a good market is stated to exist for the residual products.

Communicated Article.

GAS-METERS:
Wet and Dry.

By J. O. N. Rutter.

[*Continued from page 357.*]

What kinds of metals are used in the construction of wet meters? Cast and wrought iron, tin, antimony, zinc, copper, lead—these are the principal. With the exception of cast iron, of which some manufacturers make the cases of their meters, none of these metals are employed in their primary or simple conditions; but, always as alloys. The cases of the greatest proportion of meters are made of tinned iron, popularly, although improperly, called tin. In reality, it is thin plates of malleable iron coated (alloyed) on their surfaces with tin. The wheels, or drums, of the machines (the measuring chambers) are made of a white metal, resembling pewter, but harder. It consists of about eleven parts tin, and one part antimony. The floats, valves, and spouts, are a similar alloy. The drum-shafts, and upright shafts and bearings, are made of a hard alloy, harder than brass, but not so hard as gun-metal. Its properties are variable; different proportions of copper, zinc, and tin, and probably one or two other metals, being used in its composition. The indexes are made of brass. The solder, by which the several parts are held together, is an alloy of tin and lead. The flux—that which aids the fusion of the solder, and makes it adhere to the different metals—is chloride of zinc—zinc dissolved in hydrochloric acid.

Looked at in their relations, or, more appropriately, their oppositions, and thinking of the various metals as in certain circumstances they are known to influence, and be influenced by, each other, is it any wonder that wet meters have exhibited remarkable examples of both strength and weakness?

In copper and zinc, we have types of electrical antagonism of the highest order. If the conditions are favourable, whether the quantity be great or small, fused together (alloyed), or in separate parts, these metals are certain to operate injuriously upon each other. Nor is the process arrested, although it may go on more slowly by the presence of, or contact with, other metals. So also if the metals just mentioned were excluded, there would not be much gained by substituting others which are antagonistic. All dissimilar metals—the base, as distinguished from the precious, are of course here only intended—under certain conditions, and in a greater or lesser degree, have a tendency to destroy each other. This is not all. Similar metals—two pieces cut from the same bar, or block, or plate, if not exactly in the same state, say, for example, the surface of one piece being tarnished, and any part of the other clean and bright, they will manifest electrical disturbances in respect to each other, until the surfaces of both are in the same condition.

What is to be done? Wherever we turn, there seems only a choice of difficulties. Would it not be wiser and safer to go on as we are going, than to incur any risks by making changes? No. If there be difficulties, the greater the necessity for trying to get over them. A great deal might be learned from attentively studying analogies. We need not be long in looking about for examples—examples which are instructive, suggestive, and as I have long thought, convincing, to those whom anything would convince.

Instead of a meter consisting of at least six, if not more, different metals, why may we not have one with those metals whose habits are so mutually destructive entirely left out? The proofs of the durability of such meters are abundantly manifest, and always close to our hands. What constitutes the chief differences between station-meters and consumers' meters? Is it not that the shaft and bearings, the parts on which most depends, and which have all the hard work to do, are made of iron? Why should not the same parts of consumers' meters be constructed on the same principle, and of the same metal?

Station-meters are not out of order, nor do they require examination and repairs every few months or years. It must be in the experience of practical gas-makers that they very rarely can be said to be worn out. The hard work, and the gas products to which they are exposed, seem to have a preservative, rather than a destructive, effect upon them.

In 1841, a station-meter to pass 4500 cubic feet per hour was fixed, which was constantly at work, under my own observation, until within the last few months, when a larger meter supplied its

place. It appears to be as perfect now as it was twenty-one years ago; for it moves as easily, measures accurately, and has never had a penny expended upon it. At least 700 millions of cubic feet of gas have passed through this meter. In 1848, a larger meter than that of 1841 was fixed, whose operations I have also watched. It was opened in 1861, not because of any real, or suspected, defect; when the parts accessible appeared to be as good as if they had been at work only as many weeks as they had been years. Two station-meters, lately purchased by me for gas companies, both thrown out of work by being too small, are each apparently as likely to be in action for twenty years as if only just new from the manufactory. One had done duty for seventeen, and the other nineteen years. These little histories may serve as illustrations of what iron will do.

More might be said on the same side as to the durability of iron—good iron—when exposed to gas—crude—impure—purified; and its products, in all their phases. Valves (9-inch) fixed in 1818, and ever since in direct communication with gas in its various stages, were taken out, cleaned, and replaced in 1861. It was impossible to detect any indications of oxidation, corrosion, or actual wear; the edges of the flaps being as sharp, and the turned surfaces as fair, as if quite new. Here is a more modern example: valves connected with an exhauster in 1856, and just taken out to be cleaned. The most exposed parts are as fresh and bright as if they had only just left the planing machine, and the slides fit the grooves as accurately as if the whole was a solid piece of metal. Just now I mentioned *good* iron—an important distinction. The good cannot be too highly prized. For accurately-fitting, and hard-working machinery, inferior kinds are utterly worthless.

A few more examples must be cited; all pressing still harder, and carrying us further on, towards the conclusion that consumers' meters need not, necessarily, be so weak in some parts, whilst so strong in others. Nor must we forget that what ought to be the right order of things is really the wrong; for the active, working, parts are the most fragile, and the passive, stand-still, parts the most indestructible. Why is this? We have seen that a gas-meter, because it *is* a meter, is not liable to wear out quickly; station-meters being remarkable for longevity. Will it be said that the working parts of consumers' meters may be expected soon to be disabled—that the shafts, worms, and bearings wear out by the work they have to perform—that is, by the friction of their surfaces? Such an explanation is by no means satisfactory. It is perfectly true that these parts of meters do give out, and more frequently than is either pleasant, or convenient, to those who have to manage them; thereby causing no ending of trouble, and no reckoning of expenses. But the working together of shafts, worms, and bearings, and their destruction at the points of contact, have a deeper meaning than friction of the surfaces. The plain truth is this: the metals fused together and forming the alloys of which these parts of consumers' meters are made, are ill-adapted for the places and duties assigned to them. The zinc and copper, whatever their proportions, being immersed in water charged with gas products, can do no other than destroy each other. Every particle of the two metals is a centre of voltaic action—zinc against copper, or copper against zinc, according to the properties of the exciting medium (the water). The process is quicker in some meters than in others. I do not mean the meters of one manufacturer as compared with another's, for in this respect there are no great differences. The differences exist among those of what may be called the same batch; and are probably occasioned by the amount of work performed, the properties of the water with which the meters are charged, the qualities of the coal used for making gas, the materials employed in purification, and the arrangement and nature of the fittings with which the meters are connected.

Examine a shaft, worm, toothed-wheel, and bearings of a recently-disabled meter, the moment it is opened. The unmistakeable marks of galvano-electric action are as visible as in a worn-out voltaic battery. The failure of the rubbing surfaces at their points of contact is no mystery. How can it be otherwise? They are constantly supplied with newly-formed particles of black, hard, gritty powder (oxide); which does the same kind of work, only more effectually, as coarse sand or emery.

What causes a meter to stop? * The wearing away of the bearings, the drum-shaft, the worm, or the toothed-wheel, any one of which is sufficient to throw the upright shaft out of gear. The drum will go on measuring, but will not move the index. The shaft sometimes breaks down, and then the drum stops. Unless this happens, a drum rarely gives out. The front diaphragm is sometimes destroyed (oxidated) just above the opening for the spout; easily accounted for by its contact with the shafts, spout, and float.

One other cause of the destruction of the working parts of meters, especially as relating to galvano-electric disturbances, might be attributed to the draining into them of condensed vapour from the fittings. This is more injurious in its effects than formerly, by the use of "composition" and other inferior kinds of malleable tubing, some of which are, most likely, alloyed with zinc to harden them.

* Which oftener means the stopping of the index than of the measuring-wheel, although it includes both.

Enough—and as some, no doubt, have thought—more than enough about the malady. Can it be prevented? Can it be cured? Give up the use of the alloyed metals, and substitute the best kinds of cast iron or steel, if the latter be thought more desirable, and I believe immense good would be effected. I am not going to say that the change recommended would make consumers' meters as indestructible—comparatively indestructible—as station-meters; but I feel no hesitation in saying that such a change would be incalculably beneficial, by increasing the average period of their effectiveness.

In 1856, I had a new 3-light meter fitted up, with steel shafts, bearings, worm, and toothed-wheel; all the other parts being those of an ordinary meter. It has been worked quickly and slowly, stopped for weeks in succession, set to work again, then stopped and left without gas in it, and so on, in various ways, treated as badly, if that be possible, as some unfortunate meters on consumers' premises. This 3-light meter has worked a little over five revolutions of the index—passing, say, 500,000 cubic feet of gas. It had never been examined until the beginning of last month (May, 1862). On being opened, all the (steel) working parts were found to be in excellent condition. At the places of contact with the bearings, the drum-shaft is sufficiently worn to show the marks. All the other parts are as perfect as they well can be—showing no signs of corrosion, oxidation, or hard service. The case and drum, and their appendages, are in capital order, and, having been cleaned, the meter, in every part, appears to be capable of doing another six years' work.

As a general rule, what is the effect of hard work upon the drums and cases of consumers' meters? More than twenty years of careful observation has gradually strengthened, and, I may now say, settled, the conviction that, since drums have been made of white-metal instead of tin-plate, the galvano-electric action upon the drum itself has been lessened, and that the use of iron for the working parts would reduce it still further. The cases, if made of good plate, and properly looked after, last a number of years. How many? Twenty—thirty—thirty-five. Is that long enough? A 20-light meter, of 1832, has just been opened and examined. Its case is sound in every part, and the tin (inside) perfectly bright. The drum (tin-plate) was covered with large spots of rust (oxide), which, on being touched, broke into holes. The shafts and worm were not so much worn as in many meters which have worked three, instead of twenty-three, years. The toothed-wheel had become friable, and broke by the pressure of the fingers.

Can any complaint be made of a meter whose case shows no signs of decay at the end of thirty years, and which has been at work at one place a little over twenty-three years? Duration is not the real test of the usefulness of meters, nor is it a trustworthy exponent of their economy in a commercial sense. How much work has it done? How has it performed its duty? These are the questions which ought to come first to the mind; and the value of a meter has to be estimated by the way in which they are answered.

The 20-light meter just referred to—where has it been, and what has it been doing these last twenty-three years? Occupied in measuring gas to a church, it has not worked hard, nor has it been constantly employed. During the whole period, the quantity of gas passed through it has been 474,000—an average of 20,600 cubic feet per annum, or about one-eighth part of the quantity passed by many meters of the same size, working six nights per week, instead of a part of one night, and during winter only. Estimated by the work done, the actual durability of this meter will be less than three years. It is not a selected, nor an exceptional, example. I have noted a great many others so similar in all the principal conditions, that there would be no great difficulty in predicting the state of a meter if its history were correctly given.

Here it is that in former days so many mistakes were made, and so many erroneous opinions promulgated, about the durability of meters. Many of them, looked at only by months and years, had, as in the case I have quoted, a sort of fabulous durability. When measured by another rule, and the only correct rule applicable, the charm is broken, and for twenty-three years we find it necessary to read three years.

Work and wear have a similar meaning, whether applied to brains, or muscles, or metals. Some of each kind of material are stronger than others, so we say; forgetting all the while that strength and weakness are very closely allied. Where so many disturbing causes are at work, it is impossible to attain great exactness in estimating the working value of wet meters. Viewed in the way I have mentioned—that is, the duty performed—there are many remarkable phenomena—so remarkable that they can only be explained by referring them to a defect in construction. It is right to say that I have looked more closely after the active than the passive parts. The cases and (drum-) wheels have seemed to be so well able to take care of themselves that they have not been watched so attentively as the shafts, bearings, worms, and toothed-wheels.

Let it be noticed that, in all I am saying, I refer to well-made meters; the cases being formed of tinned plates of good quality; the (drum) wheels of the proper gauge; and all the other parts carefully selected, and put together in a workman-like manner. If these conditions are disregarded—and they have been—it is not to

be wondered at that (drum-) wheels have collapsed by their own weight, and cases have been complete wrecks in two or three years. There is the greatest possible difference between well-made and ill-made meters. I know where to put my hands upon some hundreds of meters, more than twenty years old, the cases and (drum-) wheels of which have never been repaired. Allowances must be made for the cases when placed in unfavourable situations, and for the ill-treatment they frequently receive. Kept dry and clean, they are in a sense indestructible.

The (drum) wheels almost always give out at the soldered joints; not through any defect in the metal. These fractures are caused solely by galvano-electric action. We have also a further illustration of this in its effects upon the insides of (tinned iron) cases; the tin being attacked, and, up to the water-line, entirely removed. Where this happens, the iron is left uninjured, and with as fresh-looking a surface as if just new. What can we look for, or expect, as more decisive that wet meters are true voltaic arrangements, each a small battery in its own way; or what plan more effective could have been adopted for making them self-destructive?

Repaired meters, even when all the hard-working parts are renewed, are disabled more quickly than when first set to work. This is what might have been expected. They only follow the law of their construction. Connecting new metals with old, under such circumstances, revives the electric antagonism, which is further increased by the solder which unites them.

Small meters, especially 3-light and 5-light, require repairs and renewals more frequently than the larger sizes. As a general rule, the small-sized meters do relatively the greatest amount of work. If they are not tried beyond their strength, they are beyond their capabilities; for a 3-light is compelled to do the duty intended for a 5-light, and a 5-light that which ought to be done by a 10-light; and which was not contemplated when the dimensions of their respective wheels were first settled. Nor must it be forgotten that the disproportions are great in the work (friction of surfaces) performed by different-sized meters, in passing equal quantities of gas. The (drum) wheel of a 3-light, for example, makes eight, and that of a 5-light four, revolutions for each cubic foot; whilst a 20-light, in passing the same quantity, revolves but once.

In connexion with the working of wet meters, there is a phenomenon I have very often witnessed, and which, I believe, can be referred only to electrical agency. It is a deposit on the insides and outsides of the (drum) wheels of an inflammable substance, in the form of a darkish-brown powder. When in this state, if the wheels are not carefully handled, and thoroughly cleaned, there is danger in operating upon them. The first touch of flame with the blow-pipe ignites the powder, which, if damp, will burn like a slow-match and do no mischief; but, if dry, it will explode with sufficient force to tear the wheel, and inflict serious injuries on the workman.

What is the probable cause of the durability of the cases and measuring-wheels of meters? Is it not because iron and tin agree well together, and because they are less influenced (electrically) by gas and its products, than any of the other metals?

The preparation and uses of tinned iron (tin plates) were known at a very remote period—long before anything was said, or thought, of chemistry, or metallurgy, or electricity, as sciences. In some way—and we never shall know in what way—it was found out that tin would cling very closely to iron, protecting it from air, and moisture, and other destructive agencies. Although, in common with other dissimilar metals, tin and iron exhibit electrical antagonism, it is in so small a degree, as compared with zinc and copper, that it is difficult to estimate it. Zinc and copper are not only high up, but almost at the top of the scale as electrical opponents. In plainer words, whether opposed as simple metals separately, or as an alloyed metal after being fused together, they are always struggling, when the conditions are favourable, to destroy each other. This is especially true when they are immersed in water impregnated (saturated?) with gas products; and so, after many years of observation and experience, it is known, as truly as any fact in philosophy, or in the practices of daily life can be known, that shafts, bearings, worms, and toothed-wheels, because they are made chiefly of copper and zinc, soon waste away—wear out, if that sounds better—whilst cases and (drum) wheels, because they are made of iron and tin, are almost indestructible.

Is it worth while to say any more? Will any good be effected by what has been said? The manufacturers of meters ought not to disregard these things. It is easy to shake the head, and look a little more thoughtful than usual, and then say—"Let well alone." To go on as we are going is "letting ill alone;" and, without an effort to arrest the progress of the evils complained of, the just claims of the purchasers of wet meters will not be satisfied.

Wet meters are capable of being improved, and they ought to be improved. Whatever might be done to make them (so-called) compensatory, to facilitate adjustments, to prevent the shutting off the valves, and to keep a steady water-line, will be as nothing, unless the durability of the working parts is prolonged. Innumerable proofs are at hand, showing that the best kinds of iron are scarcely sensibly affected by constant exposure to gas, and all the varieties of gas products, during, say, twenty, thirty, and even forty years. That which I did privately many years ago, I now do publicly, that is, I recommend the use of iron for the shafts, bearings, worms, and toothed-wheels of meters; and I do this because I am convinced that great benefits would ensue.

What about dry meters? We will have some talk about them before long.

(To be continued.)

Correspondence.

REMARKS ON CLAY RETORTS AND EXHAUSTERS.

SIR,—Mr. Cathels, of the Shrewsbury Gas-Works, has taken the trouble to notice my letter on "Clay Retorts and Exhausters," without producing a single argument against what I advanced, but contenting himself with quoting the opinions of other gentlemen. I distinctly stated what my opinion was based upon, and I am sorry Mr. Cathels cannot believe me, but am quite content that such opinions should be taken for what they are worth. It appears to me that what I then said has made a greater impression on him than he is willing to admit, and we all know that

> "A man convinced against his will,
> Is of his own opinion still."

Mr. Cathels having suggested certain things to modify what he terms the 5000-feet *flourish*, I think it incumbent on me to reiterate what I before stated, and I will likewise endeavour to deal with the bugbear he has created; which, however, does not in the least alarm me. I may say that, during the last fifteen years, I have tried all the shapes in retorts, from the round to the D's, and I may, I think without egotism, be allowed to form a tolerably accurate judgment as to which are the best, having set and worked them all. And, when an opinion is based upon practical operations, I must submit that with such facts as I advanced, which are very easy to be refuted were they otherwise than true, together with the coincidence of Mr. Cathels, the small D-retort worked without an exhauster is the best.

As Mr. Cathels has criticized me rather severely, I beg to say that I have no objection to compare notes with him at any time as to quality of gas, consumption of fuel, and duration of retorts—though the last named should not be taken as an element of economy, because a retort might be so set as to last seven years, making no more gas than it ought to have done in three years. I must say he has dealt rather largely in the indefinite article, and tries to dispose of a question by captious observations, such as the fire playing round retorts, &c. He must know the fire does not play round the retorts in the way he would make it appear; were *the former true, the latter might be possible*, and, as he argues for well arranged sittings of six or seven retorts in an oven, I suppose, if they did not give the quality and quantity of gas, he would say *they are not well arranged*. And, again, he sweeps off my objections to more than five retorts in an oven as as being more imaginary than real, rather curtly, but not to the point. He admits fire-retorts may be the best for small works. I will tell him of a large work where no more than five are set in an oven; Nottingham, for instance, which is equal to any provincial work in England, and presided over by one of the first gas engineers of the day, whose retorts are all D-shaped.

There are objections to giving details of workings in a public print; but I will so far maintain the position I have taken as to give Mr. Cathels a leaf out of my carbonizing book:—

Nov. 6, 1861	. . . .	15 clay retorts	. . 74,700 feet
„ 7, „	. . . .	15 „	. . 75,700 „
„ 8, „	. . . .	15 „	. . 74,400 „

The coals used were in accordance with the different yields of gas. Illuminating power 14·50 candles. He next wants to know at what temperature my gas is measured. It is not usual to take the temperature of gas before measuring it; and I should consider, if it arrived at the station-meter over 60°, the apparatus was not equal to the work it had to do. I am quite satisfied upon this head, because, after allowing a proper amount for leakage, I can make both ends meet. His query as to whether the Reading companies are under any restrictions as to the illuminating power of the gas they supply is a very harmless one, and I freely answer, no; they have not been. But Mr. Cathels must not suppose that the Reading public are not as much alive to the question of illuminating power as other towns; and we have the credit for selling gas to our customers 12 per cent. over proof.

I trust I have answered all the questions suggested by Mr. Cathels to his satisfaction; and will just ask, in conclusion, is there any incrustration of carbon in the retorts where an exhauster is used?

JOHN KEELING.

Reading, June 12, 1862.

LEAKAGE FROM GAS-MAINS.

SIR,—The importance of a correct knowledge of the loss of gas, by leaking from the mains of a gas company, cannot be doubted, and, although the means of ascertaining this are very simple, I believe they are very rarely applied.

At the present period of the year, from half-past three to half-past five o'clock in the morning, there is hardly any consumption of gas, and a suitable opportunity presents itself for ascertaining the leakage.

If a meter be temporarily placed, the inlet on the one side and

the outlet on the other side of the main-valve, the valve shut, the meter being previously open, the time and state of index of meter noted, and particular care taken that the pressure in the main at the outlet of meter is continuous and uniform, a very good account will be given of the loss in a certain time and under a certain pressure.

The loss by one pressure being known, it is a matter of calculation to ascertain the loss during the twenty-four hours, taking into account the various pressures employed during that period, and their time of duration.

As great accuracy is desirable, it may be observed that slide-valves are often defective, hydraulic being only suitable for the purpose, but should the one be defective and the other not exist, a temporary valve can be made by unscrewing a flange-joint and inserting a plate of iron between the two ends, and afterwards cementing all round on the outside; but, in this case, as it would require some time, however short it may be, to place the plate, gas would have to be passed through the meter for a period, in order to obtain the desired pressure, which obtained, the experiment should be commenced.

I think that if this were carried out more generally, engineers would be surprised *at the small amount of leakage*, and their efforts would be then employed to find out where the real loss consists, and so remedy it.

In practice, I have found a 60-light meter sufficient for 30 miles of main; this may serve as a guide for any of your readers who may be disposed to try the same. W.

London, June 11, 1862.

Register of New Patents.

2415.—George Smith, of Liverpool, in the co. of Lancaster, brass and britannia metal-finisher, for "*Improvements applicable to gas-meters.*" Patent dated Sept. 27, 1861.

This invention has for its object a simple contrivance, whereby is obtained a ready means for regulating wet gas-meters with great nicety, after the the external case is completely soldered up. Heretofore, it has been the general practice to regulate the quantity of water the meter is required to contain, to cause the index to register correctly the measurement of gas passed through the instrument, by adjusting the height of the fixed vertical syphon or overflow-pipe, by cutting it down to the required or supposed required height, before closing the external casing. Now, it has been found by experience that, although the instrument may register perfectly correctly before the outer case is permanently closed, its accuracy is often seriously affected upon being soldered up. The object of this invention is to obviate this very serious defect, and is equally applicable to meters as at present constructed, or to the construction of new instruments; and, in all cases, the water regulating the screwed plug on the side of the charging-plug chamber may be dispensed with.

To apply this invention to a wet gas-meter as now generally constructed, a small horizontal branch-pipe is connected to the present fixed vertical syphon or overflow-pipe, at a position either above or below the connecting branch-pipe which communicates with the drum-chamber of the meter; from this horizontal branch-pipe springs a vertical pipe, which runs parallel to and a little distance from the ordinary fixed vertical syphon or overflow-pipe. This supplemental vertical pipe is constructed lower, or at all events not higher, than the minimum height of the water required to be in the meter. On this fixed vertical supplemental-pipe is fitted an external pipe, which is capable of being slid up and down thereon, within a given range, like the slide of a telescope. This sliding-tube is actuated by a rack and pinion, or bands working round or over a small pulley on an horizontal spindle, or by a lever-motion, or their mechanical equivalent, all of which are to be worked by a key applied from the side, bottom, top, or back of the external casing of the meter. The vertical sliding-tube may be fitted on to the vertical supplemental-pipe on which it slides, so as to be perfectly water-tight; but, as the action of the water in which the pipe is immersed may cause it, after a time, to work stiffly, it is preferred not to fit the sliding-tube too tight, and to form one or more annular grooves on the outer surface of the inner fixed tube, for holding a suitable packing to make good the joint between the two pipes; or the grooves for containing the packing may be formed in the inner side of the sliding-tube.

In the construction of new meters, the horizontal branch-pipe and the supplemental vertical pipe springing therefrom may be dispensed with, by cutting down the ordinary syphon-pipe to the lowest point of or below the water-line, and fitting the sliding-tube thereon in the same way as is done in applying it to the vertical supplemental-pipe described, and actuating the sliding-tube through the same mechanical means.

The claim is for the construction and application to wet gas-meters of syphon or water-line regulating-pipes, which are capable of being adjusted from the exterior of the meters, substantially and in the manner and for the purpose hereinbefore described and set forth, or any mere modification of the same.

2426.—Denny Lane of the co. of the city of Cork, secretary to the Cork Gas Consumers Company, for "*Improvements in apparatus whereby to regulate the passage or flow of gas, water, or other fluids.*" Patent dated Sept. 28, 1861. (The specification of this patent, with the woodcuts necessary to explain the action of the instrument, will be given in the next Number.)

APPLICATIONS FOR LETTERS PATENT.

1623.—William Footman, of 5, Great Queen Street, Westminster, London, S.W., for "*Improvements in the treatment and use of sewage and liquid manures, and in reservoirs and pipes to be used therein.*" May 30, 1862.

1640.—William Thomas Smallwood, of Narrow Street, Limehouse, London, E., and William Wright, of Dean's Buildings, West India Dock Road, London, E., for "*Improvements in water-closets.*" May 31, 1862.

1660.—Joseph Baker, of Coatbridge, Lanark, N.B., tube manufacturer, for "*Improvements in pumps.*" June 2, 1862.

1670.—Goldsworthy Gurney, of Bude, Cornwall, for "*Improvements in apparatus for production and application of artificial light.*" June 3, 1862.

1675.—James Lee Norton, of Belle Sauvage Yard, Ludgate Hill, London, E.C., for "*Improvements in machinery for raising and forcing water.*" June 3, 1862.

1692.—George Rydill, of 5, Wardrobe Place, London, E.C., architect, for "*An improved hydraulic pump or engine for raising liquids and obtaining motive power, also applicable for the ventilation of mines and other useful purposes.*" June 5, 1862.

1703.—William Edward Newton, of 66, Chancery Lane, London, W.C., civil engineer, for "*Improvements in the construction of organs and other wind instruments, parts of which improvements are also applicable for regulating the pressure and flow of gas and air.*" A communication. June 5, 1862.

1714.—James Lovegrove, of Dalston Lane, Hackney, London, N.E., surveyor, for "*Improvements in apparatus for inspecting small sewers and drains, and for facilitating the removal of obstructions therein.*" June 9, 1862.

1718.—John, Keeling, of Reading, Berks, for "*Improvements in apparatus for the manufacture of gas.*" June 9, 1862.

1722.—Arthur John Joyce, of Cambridge Terrace, Edgeware Road, London, W., for "*Improvements in lighting and heating.*" June 9, 1862.

1733.—John George Appold, of Wilson Street, Finsbury Square, London, E.C., gentleman, for "*Improved apparatus for regulating the discharge of water and other liquids, and air and other gases.*" June 10, 1862.

1749.—Auguste Aimé Lerenard, of 60, Boulevart de Strasbourg, Paris practical engineer, for "*A new and improved cement or mastic for making joints of steam, water, or gas-pipes or chambers.*" June 12, 1862.

1751.—Henry Stockton Firman and William James Williams, of 73, Great Suffolk Street, Southwark, London, S.E., for "*Improvements in lamps, more particularly designed for burning paraffin or coal-oil, and other hydrocarbons of different grades, or any combustible material used for obtaining light.*" A communication. June 12, 1862.

GRANTS OF PROVISIONAL PROTECTION.

1443.—William Clark, of 53, Chancery Lane, London, E.C., engineer for "*Improvements in apparatus for generating motion in fluids applicable for raising and forcing water, propelling and otherwise in the distribution of motive power.*" A communication. May 13, 1862.

1523.—James Taylor, of 13, Fenchurch Buildings, Fenchurch Street, London, E.C., for "*Improvements in abstracting heat from liquids and aëriform fluids, and in apparatus employed therein, and for other purposes.*" May 20, 1862.

1525.—Edward Fewtrell, of Birmingham, Warwickshire, engine-fitter, for "*Improvements in the manufacture of metal tubes, and in machinery to be employed for that purpose.*" May 20, 1862.

1533.—Macedo Alexandre Le Brun Virloy, of No. 9, Rue Pigalle, Paris, civil engineer, for "*Improvements in drying and carbonizing wood, peat, and other fuel.*" May 21, 1862.

1564.—George Thomas Livesey, of the South Metropolitan Gas-Works, Old Kent Road, London, S.E., for "*Improvements in purifying illuminating gas, and in treating the products obtained in the various processes of purification.*" May 26, 1862.

1580.—Thomas Dutton Temple Sparrow, of Piccadilly, London, W., brush-maker, for "*An arrangement or arrangements for shading street-lights, in order to protect or shade the eyes of riders and foot passengers from the dazzling effects of the flames of such lights.*" May 26, 1862.

1602.—Ralph Martindale, of Birmingham, Warwickshire, lamp-manufacturer, for "*Improvements in the manufacture of globes and glasses, more particularly applicable to hydrocarbon and spirit-lamps, and also in fastenings for securing the globes or glasses in those and other descriptions of lamps.*" May 28, 1862.

NOTICES TO PROCEED.

257.—Hermann Schatten, C.E., of Hesse-Cassel, for "*Improvements in the manufacture or construction of gas-meters.*" Jan. 31, 1862.

270.—Leon Fauvel, of Paris, manufacturer, for "*Improvements in apparatus for indicating the existence of escapes in gas-tubing, and for stopping the continuance thereof.*" Feb. 1, 1862.

290.—George Manwaring, of Southampton, Hants, engineer, for "*Improvements in flushing apparatus for closets, sewers, and other water-services.*" Feb. 4, 1862.

297.—James Webster, of Birmingham, Warwick, engineer, for "*Improvements in gas-fittings.*" Feb. 4, 1862.

316.—Michael Henry, of 84, Fleet Street, London, E.C., for "*Improvements in obtaining and applying motive power, and raising and forcing liquids.*" A communication. Feb. 6, 1862.

866.—Eugène Théodore Noualhier, of Paris, manufacturer, for "*An improved ventilator.*" March 28, 1862.

1146.—William Rose, of Halesowen, Worcestershire, manufacturer, for "*Improvements in the manufacture of tubes, more especially applicable to the barrels of fire-arms and ordnance.*" April 19, 1862.

1231.—Squier Cheavin and George Cheavin (his son), both of Boston, Lincolnshire, for "*Improvements in filtering and purifying water, and in apparatus employed therein.*" April 26, 1862.

1439.—Gideon Blake, of Trowbridge, Wilts, engineer, for "*Improvements in apparatus for warming apartments.*" May 13, 1862.

Parliamentary Intelligence.

HOUSE OF LORDS.

TUESDAY, JUNE 3, 1862.

The Royal Assent was given to the East London Water, the Barnsley Local Board of Health, the Leeds New Gas, the Bristol Water, the Falmouth Water, the Bollington (Prestbury) Improvement and Lighting, the Dundee Water, the Kent Water, and the Leeds Water Bills.

The Highways Bill was read a first time.

FRIDAY, JUNE 13.

A petition against the Liverpool Corporation Water Bill was deposited, from the inhabitants, &c., of Liverpool.

The Kent County Gaol and Lunatic Asylum (Water Supply) Bill was brought from the Commons, read a first time, and referred to the Examiners.

The Stretford Gas and the Windermere District Gas Bills were returned from the Commons, agreed to.

HOUSE OF COMMONS.

MONDAY, JUNE 2, 1862.

The Parochial Assessments Bill was reported, as also the Aberdeen Police, Water, &c., Bill.

The Kent County Gaol and Lunatic Asylum (Water Supply) Bill, as amended, was considered, and ordered to be read a third time.

The Highways Bill was read a third time, and passed.

TUESDAY, JUNE 3.

The Reading and Reading Union Gas Company's, and the Wakefield Water Bills, were reported, with amendments.

The Windermere District Gas and the Stretford Gas Bills were reported, without amendments, and ordered to be read a third time.

Parochial Assessments Bill.—A petition against the Bill was presented from the Leamington Priors Gas Company.

THURSDAY, JUNE 5.

The Kent County Gaol and Lunatic Asylum (Water Supply) Bill was read a third time, and passed.

Parochial Assessments Bill.—A petition against the Bill was presented.

THURSDAY, JUNE 12.

The Stretford Gas and the Windermere District Gas Bills, were read a third time, and passed.

The Wakefield Water Bill, as amended, was considered, and ordered to be read a third time.

FRIDAY, JUNE 13.

The Reading and Reading Union Gas Companies Bill, as amended, was considered, and ordered to be read a third time.

HOUSE OF LORDS.

WEDNESDAY, MARCH 12.

(*Before the* Lord Chamberlain, *Chairman, the Marquis of* Sligo, *and Lords* Dartrey, Keane, *and* Silchester.)

LEEDS WATER BILL.

Serjeant Wrangham, Mr. Calvert, Q.C., and Mr. Venables, appeared for the corporation of Leeds, the promoters of the bill; Mr. Russell for Captain Gunter, and Mr. Clerk for Mr. Coates, petitioners against it.

Serjeant Wrangham, in opening the case, said, this was a bill promoted by the mayor, aldermen, and burgesses of the borough of Leeds, for powers to enable them to furnish a further supply of water to the town and neighbourhood of Leeds, from the river Wharfe, and for other purposes. By an Act of Parliament passed in 1856, the corporation, having previously constructed works to supply the town, obtained permission, by means of such works, to take any quantity of water from the river Wharfe, not exceeding in any one day 2½ million gallons, due provision being made for compensating the owners and occupiers upon the banks of, and all parties interested in the waters of, that river, for any damage sustained by them, by reason or in consequence of the abstraction of water or other injury done by them. The town of Leeds was a large and most important town—the centre of the manufacturing interest of the West Riding—and it was a matter of the first consideration, as well for manufacturing as for domestic and sanitary purposes, that there should be an efficient supply of water. At present, it was found that that supply was wholly inefficient. The demand was about 5 million gallons per diem, whereas the supply from all sources was only 3½ million gallons in dry weather, and 4 million gallons under the most favourable circumstances. The corporation felt that they were bound to provide, not only for the existing state of things, but for that state which they might anticipate would exist in a few years time. It was undesirable that they should be under the necessity of coming to Parliament for additional powers every few years; and they therefore proposed by the bill now before the committee, to provide for the prospective increase in population for the next fifteen years. For that purpose, they asked for power to take from the river Wharfe a quantity of water not exceeding 6 million gallons per day, inclusive of the 2½ million gallons they were now authorized to take. Nothing, he thought, could be more reasonable than that, with a view to meet the sanitary and commercial wants of a population like that, there should be an ample supply of what was one of the first necessaries of life; and no means of providing that supply was so ready and natural as to draw it from the contiguous river. The opposition to the bill was confined to two petitioners. One was a gentleman named Coates, who resided at Wetherby, a town situated seven miles further down the river than the pumping-station of the promoters. There was no opposition on the part of the millowners, who were the parties generally petitioning against any scheme which proposed to take water from the river. These parties were all content before to take compensation in money rather than in water. Mr. Coates was a brewer, deriving his supply of water not direct from the river to his own land—for he was not a riparian proprietor—but it was conveyed through the intervening land of a Mr. Montague, who was the owner of certain mills, and a well-wisher of the present measure. The opposition of Mr. Coates was, therefore, somewhat different to what it would have been had he been the owner of water-side premises; but, he submitted that, however regarded, it could not, for one moment, be supposed that, if the water-works abstracted a much larger quantity of water from the Wharfe than was really proposed, there would not be an ample supply left for the petitioner, whose petition alleged that the promoters would take half, and sometimes more, of the volume of the stream. It appeared, however, that at Arthington the river had been ganged, and it was found that the ordinary summer flow was 30 million gallons per day, and, after long drought, it was not reduced below 20 millions; therefore, under the most unfavourable circumstances, there would remain 14 millions after the promoters had taken the maximum quantity which this bill asked for permission to take. But it was a mistake to suppose that the river at Arthington was the same as where the corporation took their supply higher up, there being three large becks which fell into the Wharfe before it reached Wetherby. He believed the volume of those becks would be about equal to one-third of the Wharfe at the point at Arthington where they fell into the river; and, therefore, the quantity abstracted by the corporation would be more than replaced before it reached the premises of Mr. Coates. The petitioner further alleged that there were other streams to which recourse might be had, and referred specially to one called the Washburne. This was a stream which rose in the adjacent moors to the north of the Wharfe, and fell into that river about half way between Otley and Arthington. He (Serjeant Wrangham) confessed that he could not see the propriety of saying that it would be preferable to take the water from one of the feeders of the Wharfe, instead of from the river itself. Moreover, to do so, the corporation would have to expend a large sum of money in the construction of new works, although their existing works were amply sufficient for the purpose of the increased quantity they proposed by this bill to take. But, beyond the economical considerations, there was an objection which had proved fatal to all former attempts to appropriate the Washburne. That stream, it appeared, flowed, for almost its entire length, through the estate of Mr. Fowkes, a large proprietor, and was as beautiful and picturesque a stream as could be found in the length and breadth of this land. When, some ten or twelve years ago, it was proposed to supply Leeds from the Washburne, Mr. Fowkes felt that it would be so seriously detrimental to his estate that he offered the most vigorous opposition to the scheme, and was successful in defeating it. It was evident also that, even if it could now be carried out, Mr. Coates would not, in any respect, be benefited by the corporation taking their supply from the Washburne. The petition then alleged that the present plan was needlessly expensive, and that the estimates for the cost of the works were altogether inadequate. This was evidently an old stereotyped petition, which Mr. Coates, who was a lawyer as well as a brewer, had discovered, and could not be at all applicable in the present case, because no new works were contemplated. The corporation required only a little more pumping-power, and, therefore, the allegation of insufficient estimates was altogether out of place. The other petitioner was Captain Gunter, the proprietor, by purchase in 1856, of an estate called Wetherby Grange, which lay immediately below the town of Wetherby. The petitioner was apprehensive that, by the abstraction of more water, the river, which ran through his property for about a mile, and skirted it for a longer distance, would be so much reduced in volume, that he would suffer thereby. He seemed, however, to have forgotten that, if any such contingency arose, there were provisions in the General Act, to which the corporation were amenable, for repairing such injury. The truth was, however, that the fears of these gentlemen were altogether unfounded. Their allegations were based upon the assumption that the river at Wetherby was the same as at Arthington, the petitioners being forgetful of the existence of the becks which flowed in between the two places. He (Serjeant Wrangham) thought that he should be able to show by evidence that the petitioners would sustain no damage by the present scheme, and that, therefore, their opposition ought not to weigh against the accomplishment of so important an object to the welfare of the large and increasing borough of Leeds.

Mr. *George Brooks*, examined by Mr. Calvert.

I am a member of the Leeds town council. There is a water-works committee appointed by the corporation, and I am the chairman of that committee. I am well acquainted with the borough, and the nature of its requirements in reference to water. The population is now 207,184. In 1852, it was 175,745, so that it has increased 31,389 in the interval. The present supply of water is not sufficient to meet the wants of the town. The district within which the supply is afforded is the borough of Leeds. We have authority to supply Addle, Harewood, and Otley. At the present time, we can bring into Leeds rather over 4 million gallons of water per day. We have works at Arthington, from which we obtain 2½ million gallons, under the authority of our Act of Parliament, and by agreement with the different claimants. We have another gathering-ground at Eccup, with a reservoir at Stubhouse. In dry weather, the quantity of water we there obtain is not more than 1½ million gallons; and, on the average, 1½ million. We have negotiated with the different millowners on the Wharfe below our pumping establishment. In 1856, we settled with the Earl of Harewood for 6 million gallons. The other parties—Mr. Montague, Mr. Attercliffe, and Lord Londesborough—we have compensated each of these, to enable us to take 3½ million gallons more. That is the quantity we are asking the authority of Parliament for. We are ready to treat with Captain Gunter on the same footing, if necessary to do so. Mr. Coates has, I believe, no property on the Wharfe. We have lately constructed considerable works at Leeds. We have large filter-beds at Weetwood, a distance of 2½ miles from the centre of the town, capable of filtering from 5 million to 6 million gallons per day. The water passes thence, through pipes, to the town; and on Woodhouse Moor we have a small service-reservoir, which enables us to furnish the supply better than we otherwise could do. We have spent about £18,000 upon the filter-beds, and about £12,000 in other parts of the district. In 1856, we did not supply any of the higher levels in the borough; we now supply nearly the whole of those places, having constructed works and erected a steam-engine for the purpose. The income we receive from our water-works is £22,303, and the amount expended upon them was £319,284. If we obtain the bill we now ask for, we shall not have to exercise our borrowing powers, nor impose any increased rates upon the inhabitants; so that this is by far the cheapest mode of securing an additional supply of water.

Cross-examined by Mr. RUSSELL: I believe that Captain Gunter has land on one or both sides of the Wharfe for some distance, and his house is upon land close to the river. I do not know whether he is dependent upon the river for the supply of water to his estate; if he were, he would have enough for fifty such estates. We did not negotiate with him, because we did not think he would be injured by this scheme, as he has no mills on the stream. We went to the other proprietors named, because of their being millowners.

By Mr. CLERK: I know the brewery of Mr. Coates, at Wetherby. The first cost of our works, in 1852, was £225,730. The Arthington pumping-station was about £50,000, including the purchase of land, putting down pipes, compensation, law expenses, &c. That sum does not include the reservoir at Eccup. I cannot tell the exact quantity of water we have taken from the Wharfe. We have a counter upon the pump of the engine, which tells the number of strokes it makes, and we know the quantity raised by each stroke. When we commenced our works, we supplied 500,000 gallons a day; we afterwards increased it, till we have got up to a daily consumption of 3,115,000 gallons, including the quantity obtained at Eccup. For our prospective works, there will be £12,000 for compensation, and about £18,000 for steam-power at Arthington. We have not agreed to buy the mills at Wetherby. We are in treaty to buy one for £7500. I have not inquired into the respective populations in the valleys of the Wharfe and the Washburne. I should say the latter was very insignificant in comparison. The question of the relative merits of the Wharfe and Washburne schemes was much gone into previous to 1855. There are many villages on the Wharfe above Leeds. There are cloth-mills which discharge refuse into it, but that is not much. There is a lead-mill many miles above. [Witness was interrogated as to discussions in the town council respecting the merits of the two schemes, and as to the possibility of taking water from the the Washburne at Fewston.]

Re-examined by Mr. CALVERT: No proposition has been made to take water from Fewston since I have been in the town council.

Thomas Hawksley, Esq., examined by Mr. CALVERT.

I am consulting engineer to the Leeds corporation, and made the pumping-works for them at Arthington, under the provisions of their Act of Parliament. Up to that time, the corporation had an agreement with Lord Harewood, by means of which they had a quantity of water from the Wharfe, to supplement the supply from the drainage area, in which they had a large reservoir, purchased of the water-works company. The extent of that drainage area is about 1500 acres; and it yields in wet years about 1½ million gallons per day, and in dry years about 100,000 gallons. The latter quantity was quite inadequate for the supply of Leeds. The town is situated on the Aire, but it is not possible to get a supply from that river, as the water is so polluted. The works were constructed near Harewood House, and the pipes went immediately through the park. Lord Harewood found it was inconvenient, and desired to put an end to the agreement on certain terms, giving, as far as he could, the right to take any supply required from the Wharfe. He also agreed that the corporation might ultimately take from that river as much as 6 million gallons per day: but the Act of Parliament then obtained authorized them to take only 2½ million gallons. Arrangements had been made with some of the parties on the river for taking a much larger quantity. The minimum supply in dry years is now 3½ million gallons. Leeds requires, at the present time, about 4½ million gallons, giving 25 gallons per head per day. The quantity of water is much restricted for sanitary and domestic purposes, in consequence of the means of the corporation being limited. The population within the district at present supplied is 180,000; the population for which we ought to make provision is 300,000—that is to say, a provision for twenty or thirty years to come—otherwise, there will be a necessity for continually applying to Parliament for extensions. Looking to such a population, I think from 7 million to 7½ million gallons per day is what we should now ask power to obtain. In negotiating with the millowners on the Wharfe, the corporation have had in view the addition of 3½ million gallons to the present quantity taken from the river. The works are calculated to bring such a supply to Leeds; the main-pipes were laid down with that intention. The volume of the water in the Wharfe is generally exceedingly large; the minimum volume, after the longest drought, is about 24 million gallons at Arthington-where we propose to take 6 million gallons. At Wetherby, the volume is about 30 million gallons. Between those places, there are some consider, able tributaries on both sides. Supposing we get our 6 million gallons at Arthington, the 30 millions at Wetherby would be reduced to 24 millions at Wetherby; but usually there is a much larger quantity there. This only applies to a few days after there has been a long period of drought, such as there was in 1859, which was the most severe drought known since 1826. There are about 300 square miles of drainage area down to Wetherby There are several riparian owners beside Captain Gunter; if he is damaged, so will they be, and he will have the same remedy that they have. There is a clause in the Water-Works Clauses Act, to meet these particular cases, which provides that full compensation shall be given for the value of land and streams so taken and used, or for damage done. That is an easily-applied remedy, and is the one upon which riparian owners usually rely. I could mention instances in which it has been found amply sufficient. I am well acquainted with the river Washburne. The only advantage that could possibly be derived from it would be, that its waters, which are tributary to the Wharfe above Arthington works, are, on the average, somewhat softer than those on the Wharfe; but there are great difficulties, both physical and otherwise, in obtaining it. The water runs through property of great value, especially a very beautiful estate belonging to Mr. Fowkes; and, in order to utilize it, very large reservoirs would have to be made. The stream is exceedingly small in dry weather, and no supply could be obtained from it without making reservoirs, which would cost a large sum of money. A scheme was proposed seven or eight years ago, and was then objected to by Mr. Fowkes. The effect of adopting it would be, that in periods of drought the stream would be dried up, and irreparable damage inflicted, unless compensation-reservoirs were constructed, which would add very materially to the expense. The Wharfe, as distinguished from the Washburne, is a very large river, and always yields a great quantity of water, so that it is not at all necessary to make compensation-reservoirs upon it. There is always much more water than is necessary for riparian purposes, inasmuch as all the owners of mills have agreed to take money compensation. The quality of the water is very good, but not quite so soft as water coming from sandstone wholly, the upper part of the Wharfe being a limestone district. After passing through filters, it would be very good water for Leeds. It first goes into the Eccup reservoir: and, if at any particular period of the year it should be found in an impure state, it would pass into the filter-beds, where any light flocculent matters not deposited would be filtered away. With reference to Mr. Coates, he has no property on the Wharfe, and there will be plenty of water for him. I cannot see that any damage would be done to Captain Gunter, or any other gentleman having property on the river.

Cross-examined by Mr. RUSSELL: The minimum flow of water in the Wharfe in dry seasons at Leeds is 24 million gallons. [Mr. Russell quoted from evidence given by the witness before the Bradford Water Committee in the House of Commons, in which the following question and answer occur: "What is the minimum flow of the Wharfe at the Leeds pumping-station?" "I should think about 20 million gallons per diem at the present time. Of course, no water is taken for the works at present."] That is correct. But, then, there are the compensation-waters, which come from the Dib reservoir, which has not been finished two years. I do not recollect when the measurements were taken upon which I gave 24 million gallons as the minimum flow. You are not justified in calling either of these estimates a guess. I have myself gauged the flow of the water over the weir. The flow at Wetherby is 30 million gallons. There are no good means of gauging the water. It is assumed that a certain additional quantity of water will go into the water between Arthington and Wetherby. The drainage-area there is somewhat about 190,000 acres. I have no doubt that there are 150 million gallons of water at Wetherby, upon the average, and much more, judging from the quantity of rainfall in the vicinity.

Mr. RUSSELL: The river goes through Captain Gunter's estate for the distance of two miles. Did you ever know of a gentleman applying for compensation under such circumstances, under the 6th section of the Water Clauses Act?

Witness: I do not think I know of a parallel instance, in the case of so large a river. On smaller streams, I have, again and again; and, of course, what applies to small streams applies to large rivers, with this difference, that whereas in one case much mischief is done, in the other there is none at all. It is not customary to compensate with water. I should think there are as many instances one way as the other. At Liverpool, the compensation was generally made in water for mills, which had nothing to do with landowners. The water flowed past the property of landowners, but the opposition on which the compensation was given came from the mills. On large rivers, where compensation for mills is given in money, it may be that no injury is done by the abstraction of water, and then, of course, the riparian owner makes no claim for compensation. I do not think the best way to prevent injury is to send water down; I believe the best way would be not to take the water at all, and for this reason, that even if you make a compensation-reservoir you change the state of things, and many gentlemen object to that. We have as many objections to compensation-reservoirs as to money payments. The objection of Mr. Fowkes to the abstraction of water from the Washburne was, that it would be a great injury to the amenity of his estate. I acted for him on that occasion, and had the pleasure of making arrangements for him with the Leeds corporation, under which the latter were at liberty to take water from the lower part of the stream after it had passed through his estate. The scheme, however, was not carried out, but the Arthington works were built with the consent of Mr. Fowkes. Some persons object to the Wharfe as a polluted stream, but I have no such objection. It is a river which passes through a district where the population is sparse—in which there is no coal, and few manufacturing works; but, should such be erected hereafter, which I do not apprehend, the corporation would have power to take water from the Washburne under the arrangement I have mentioned.

By Mr. CLERK: By that arrangement, the water was not to be taken from the stream at Fewston. The compensation-reservoir was to be at Leathley Wood. The enlarged plan now proposed will not cost more than £20,000, except the expense for compensation. The actual cost of pumping to the Leeds corporation is as nearly as possible a ½d. per 1000 gallons, or under £1000 last year, as they pumped 500 million gallons. The whole volume of the Washburne in dry seasons is 4 million gallons per day, and I have known it to produce in a great flood 250 million gallons. I cannot speak as to the extent of the gathering-ground of the Washburne. The head of the Wharfe and the Washburne is very high ground, and the limestone formation, which is very porous, extends for many miles there. Up to Arthington the Washburne has not those powerful springs, and that is the reason it falls so low. I ascertained the volume of water in the Washburne during a heavy flood to be 250 million gallons per day, by taking the velocity and ascension where it ran between high ground, at the time I was engaged for Mr. Fowkes, on which occasion there was a great storm. The land on the Washburne ought not to be characterized as low land, because sometimes, in the course of a mile, the ascents are from 100 to 200 feet. I do not recollect whether, in 1852, I told Mr. Leathers that for any quantity above 4 million gallons per day it would be better to take the water from the Washburne by gravitation at Fewston.

Re-examined by Mr. VENABLES: To take the supply from the Washburne in dry weather would wholly exhaust it, and the damage to Mr. Fowkes estate would be very great. There is no comparison between the position of that gentleman and Captain Gunter. To the very last, Mr. Fowkes, although he entered into the scheme in 1852 at my recommendation, was opposed to it. My calculation of 6 million gallons per day as the dry-weather yield between Arthington and Wetherby is founded upon this, that the general drainage area is increased by nearly 30,000 out of 160,000 acres. I deal with the fact in this way—that the upper portion of the Wharfe (I am speaking not of the limestone district, but of the whole) yields but little water in dry weather, except from the springs. The lower portion yields more water in drought, and, therefore, allowing a small additional quantity, something more than the proportion of one-fifth, which would give 5 million gallons as the increment; I allow 6 millions, which, added to the 24 millions, makes the 30 millions spoken of, and, which, I think, is a near approximation. I have known, in similar cases, compensation given under the Water Clauses Act in money, the injury being small, but the right being infringed. With regard to taking land, the Land Clauses Act provides that the compensation shall be assessed before the land is taken; with regard to the Water Clauses Act, the compensation is to be assessed after the damage inflicted has been ascertained.

The CHAIRMAN: Would that compensation be given in money or water?

Witness: The Act provides solely for compensation in money.

By Mr. VENABLES: Where compensation is given in water, it is almost always in the case of millowners. It is not usual to make compensation in water, when the injury or alleged injury arises from the abstraction of water on the lower part of a large stream; but, where the injury is done upon the upper part of a stream which afterwards becomes large, then it is the usual, but not the invariable rule, because the abstraction of water in the upper part of the valley becomes a serious deprivation to the lower part.

Edward Baines, Esq., M.P., examined by Mr. VENABLES.

I am member for the borough of Leeds, and have been long resident in the place. The district of the corporation water supply comprises 21,572 acres, and there is a very large and rapidly-increasing demand for water, for

trade purposes especially. There is a greater variety of industrial occupation in Leeds than in any other place with which I am acquainted, except London and Manchester. The three principal branches of manufacture are the woollen, flax-spinning, and iron-works. There are manufactories for machines, locomotive and other engines, steam-ploughs, and machinery of every description. There are many dye-works, and the largest leather and boot and shoe factories in England, except two. There are also a large number of chemical-works, a considerable manufacture of glass and pottery of various kinds, including sanitary tubes; and one of the largest tobacco factories in the kingdom—second only to Bristol. For many of these purposes, large quantities of water are required; and all of these trades are in a state of progress.

Mr. VENABLES: Can you state, from your own knowledge or inquiry, whether the population is still increasing at the rate at which it increased during the last decennial period?

Witness: I have no positive information; I can only judge from the number of houses built, and the difficulty there is in obtaining one. Taking that as a standard, I should judge that the rate of progress in the population is as great as at any former period. It has been a very prominent object with the town council and the inhabitants, for many years past, to get a better supply of water. I think it would be prudent to provide for a prospective increase, as well as for the present actual population. I have not minutely examined the plan of the corporation, but, as far as I am able to judge, I think it is the best mode of giving an additional water supply to the town.

Mr. *Filliter*, examined by Mr. VENABLES.

I am the borough surveyor of Leeds, and local superintendent of the water-works. The present supply is barely sufficient for the wants of the town. The demand has been rapidly increasing during the last few years. In 1845, the quantity of water pumped was 905,000 gallons per diem. In 1856, when the Arthington works were first brought into operation, the quantity was 1,596,000 gallons, and in 1861 it was 3,115,000 gallons. In the last year, during one month, we pumped 3,330,000 gallons per day. We supply 37,101 private houses, and 209 large consumers. Our average supply for private houses is 84 gallons per day, which is below that of other towns with which I am acquainted. We can draw 2½ million gallons per day from the Wharfe; we have also a small supply from the gathering-ground of the Eccup store reservoir, which has been as low in dry seasons as 500,000 gallons per day. There are about 46,000 houses in Leeds, a considerable number of which are unsupplied. In 1871, at the present rate of increase, the population will be 250,000. To supply that population, at the ordinary calculation of 25 gallons per head per day, we should require 6½ million gallons of water. I estimate that the additional 3½ million gallons, which it is proposed by this bill to take, will be sufficient for twelve or fourteen years. The quality of the water is very good. It varies, according to the analyses made a few years ago by Dr. Hofmann, from 5° or 6° to 10° of hardness. We propose to filter it; the beds for the purpose are not quite completed. We take no power in the bill to make new works, as we merely require additional engines, which we have power in our present Act to obtain. We shall require engines sufficient to pump 3½ million gallons per day, of 250 nominal horse-power; the cost of which, with the pumps, I estimate at £14,000, which, with £4000 for house, &c., will make a total expenditure of £18,000. The working expenses will be covered by the additional water-rate consequently, there will be no burden thrown upon the corporation. The whole expense to the corporation, in the first instance, will be the cost of machinery, and the compensation to millowners. The present surplus profits will cover more than the interest on the expenditure. If the works are made efficient, we look forward, as the population increases, to a reduction in the rates. I know that it is a usual thing to compensate in money, and not in water.

Cross-examined by Mr. CLERK: I estimate the annual cost in this way—£18,000 for the machinery and buildings, added to £12,000 for compensation, or a total of £30,000 is the capital to be expended at this time. Four per cent. upon that is £1200 per annum for interest. The working expenses, including coals, labour, &c., repairs to buildings and all other things, will be £11,000, making a total cost of £2300 for the additional supply of 3½ million gallons. The cost per annum for pumping at the Arthington works was £977 last year.

Mr. *J. R. Clark*, examined by Mr. VENABLES.

I am inspector of the water-works, and have held my present office four years. I know the demand for water has much increased during the last two years, both for domestic and trade purposes. Our district mains require enlarging, but we cannot enlarge them till we get an additional supply of water. We have had demands from Wortley and other places to lay the water on, but have not been able to do so. There is a scarcity of cottage accommodation at Leeds, and our inability to supply water prevents building operations. The use of water-closets is largely increasing, causing a great consumption and waste of water.

Mr. *John Brown*, examined by Mr. VENABLES.

I am agent to Mr. Hadfield, a mill-owner on the Wharfe. Between Wetherby and Tadcaster, I should think there are at least 4 million gallons of water coming into the river. I believe there will be quite sufficient for the navigation if the present scheme is carried out, as the craft is very small. At Flint Mill, our dam-head backs up a considerable quantity of water towards Wetherby; the flow of water above is therefore increased. We have more water a great deal than we use, and our wheel is frequently suffering from back water. We consider that we have 30 million gallons of water at Flint mill, as a minimum; the average is much larger. We are never short of water except on Monday morning, which is in consequence of the mills above us having dammed it up on the Saturday to commence work with on Monday. I do not think the quantity proposed to be taken out would be perceptible at Captain Gunter's estate.

Cross-examined by Mr. CLERK: We have £6000 compensation given to us for the whole. We had two wheels at Flint Mill; we have now only one. We have two mills at Thorp Arch, and four wheels. One mill there we have stopped.

This was the case for the promoters. Evidence was then taken in support of the petition of Mr. Coates; and Mr. Utley, an old inhabitant on the banks of the Wharfe, Mr. Kitching, a millwright, and the petitioner himself, were examined, to prove that there was now less water in the river than formerly, and that any further abstraction would be very injurious to his business.

J. W. Leather, Esq., examined by Mr. CLERK.

I am an engineer, residing at Leeds, and have had considerable experience in the construction of water-works. I know the valleys of the Wharfe and the Washburne very intimately, from the circumstance of having to provide works for the supply of Leeds and Bradford, which are both situated upon the Aire. I constructed the works for both those towns, with the exception of the pumping-station at Arthington. The Leeds Company first took water from the Wharfe in 1851. The supply before that time had been from a gathering ground of 1500 acres, above the Eccup Reservoir, which yielded about 1½ million gallons per day. In dry seasons, the rainfall being diminished, there was a scarcity of water; and a temporary pumping-station, by permission of Lord Harewood, was erected, and we were permitted to pass the water through his park, and erect our conduit there. That was looked upon as a mere temporary expedient. The Wharfe flows through highly-cultivated land, and contains an enormous quantity of sewage; and the pumpings-tation at Harewood receives so much of the drainage of cultivated land, that I think it is not desirable, as a source of supply, for a town like Leeds. The area of drainage of the Wharfe at Pool Mill (including the Washburne, which is about 27,000 acres), is 150,000 acres.

Mr. VENABLES objected that the witness was about to propose a rival scheme. There was nothing in the petition which enabled him to do so, there being only a general allegation that a better supply might be obtained.

The CHAIRMAN said, the committee would not go into any evidence of that kind.

Mr. CLERK said, the object was to show that the present was not by any means a proper scheme for Leeds at all, and that it ought not to be adopted, because it inflicted injury upon his client without giving compensation in water, while there was another scheme which the promoters supported at one time—a better one, viz., the Washburne scheme, the adoption of which would be no injury to the petitioners in this case. He was not there to deny that an additional supply to Leeds was wanted, but that this was not the place to take it from. He would show, upon the highest engineering evidence, that the Washburne was the better scheme of the two.

Mr. VENABLES said, admitting that such was the case, the Washburne ran into the Wharfe, and every drop of water taken from the former would produce the same effect upon Mr. Coates that its abstraction from the latter would do. Besides, there were great objections to that scheme on the part of the landowners who were not before their lordships, and could not be heard against it.

Lord DARTREY: What possible difference can it make to the petitioner, whether the water is taken from the Washburne or the Wharfe?

Mr. CLERK said, he should prove that if taken from the Washburne at Fewston there would be a better supply, and that the corporation could there have a compensation-reservoir which was all the petitioner wanted.

Examination continued: The population on the Wharfe, as compared with that on the Washburne, is as 3 to 1. There are no mills of any consequence above Fewston. The proposition which was made in 1852 was to take for the purposes of Leeds 6 million gallons per day, to construct reservoirs, and to send down the Washburne 5 million gallons daily as compensation. By that scheme, Leeds might obtain 10 million gallons of water a day for much less money than by the one now proposed. My estimate is £100,000 for 10 million gallons, and £85,000 for 6 millions, including compensation in water to the millowners. The cost of the Arthington scheme will be £55,007 on capital account, and capitalizing the £1130 of estimated annual expenditure at 4 per cent. will give a further sum equivalent to an outlay of £28,000, making the cost of obtaining 6 million gallons £83,007. But, I find that only represents an average quantity pumped of 1 million gallons, whereas the total supply pumped is 2½ millions. Then, as to the further costs, assuming their own estimate of £30,000 to be immediately laid out, and £2300 of annual expenditure capitalized at twenty-five years purchase £57,500, the cost of obtaining the additional 3½ million gallons would be £87,500, or more than was necessary to obtain 6 million gallons from the Washburne. Another element in favour of the latter scheme was, that it would set at liberty the valuable machinery now necessary for pumping the Wharfe, which would be an asset towards the expense required to be incurred.

By the COMMITTEE: This plan was not before Parliament, but was before the Leeds corporation. At that time, they were in treaty with the water company to purchase their works, and they thought it not worth while to enter upon this scheme. It was rejected in 1856, when the corporation came to Parliament, because it was represented that it would cost £300,000, and that they could get all they wanted for £30,000. That argument was used in the town council, but it never came before Parliament. The corporation erected their works before they came, and then asked Parliament to legalize what they had done.

By Mr. CLERK: Mr. Hawksley's estimate at that time was that, if a larger supply than 4 million gallons was contemplated, the Washburne was the better scheme. I think it is always desirable to have compensation-reservoirs, especially when so large a proportion of the dry-weather supply is proposed to be taken. I have not gauged the river—there are heavy floods upon it. There is very little water falls into the Wharfe between Arthington and Wetherby. The Washburne is a mountain stream. There are several sites for a compensating-reservoir in its valley, and its construction would not be a costly matter. The corporation of Leeds might compensate the whole river in time for less than they will have to compensate the six mills.

Cross-examined by Mr. VENABLES: In the Bradford Water-Works scheme, of which I am the engineer, we propose to give compensation, in water, to the millowners, as the most feasible and cheapest mode, and I think it will be the best plan for the Leeds corporation to adopt. In 1852, the corporation had nine directors in the water company, and they were almost unanimous in favour of the Washburne scheme, but the shareholders did not see their way to spend the money. It appears to have been overlooked in 1856, and the Arthington scheme was compared with one at Skirfair, and, under the delusion that the one would cost £300,000 and the other £30,000, the former was adopted. The Washburne scheme has never been formally laid before the town council. Professor Hofmann's report upon it was delusive. Mr. Coates will be damaged in dry seasons by the river being more contaminated on account of the volume of water being less. I do not say that he will not have enough water. By extending his pipe further into the river, he will get water at any time, but it will be of inferior quality. I should not recommend the corporation to construct a compensation-reservoir for Mr. Coates alone. I think the navigation would be affected by the proposed abstraction of water.

Re-examined by Mr. CLERK: If Mr. Coates's pipe is extended into the river, he will draw his supply from the mud, and not from the surface. There is no provision in this bill by which the corporation, though only authorized to take 6 million gallons, may not in any one day take 9 millions. The average of the whole year would not at all represent the amount pumped by them daily during the summer months of a dry season.

THURSDAY, MARCH 13.

J. F. Bateman, Esq., examined by Mr. CLERK.

I was employed in 1851-2, to examine the whole question of the water

supply of Leeds—both the Washburne scheme, as proposed by Mr. Leather, and various other schemes; and I decidedly approved of the former. It is a scheme peculiarly calculated for giving compensation in water. If the corporation continue to pump from Arthington, they may still give compensation from the Washburne. The cost of doing so to the extent of 3½ million gallons would be about £15,000, which was the amount of Mr. Hawksley's estimate in 1851, when he was engaged for Mr. Fowkes, and required that the company should construct a reservoir at Leathley Wood. I think the present is a case in which compensation should be given in water. There are greater facilities for doing so where there are mountain floods than in other cases. Wherever it can be done, in my opinion, it is the right mode of treating streams from which water is taken for the supply of large towns, because the abstraction of the water is an injury, not only to millowners, but to everybody on the banks, as well as the landowners and the navigation. The general effect of water-works, where the principle of compensation-reservoirs is adopted, is, that the stream is much improved in dry weather. That is the case in the Manchester Water-Works, of which I am the engineer; also, at Glasgow, as well as at Liverpool, which are Mr. Hawksley's. In all the great works of the country, the principle is adopted; and, wherever companies are permitted to go to streams where they have no right, it is required that they shall leave the parties in as good a condition as they were before. The general arrangements made are certainly for the interests of the parties whose waters are taken, inasmuch as it is desirable to have the streams increased in dry weather, and not injurious in floods. In the Bradford scheme, there are compensation-reservoirs; and, when that scheme is brought into operation, the volume of the Wharfe, so far as it is interfered with by the Bradford corporation, will be increased in dry weather. From my knowledge of the river, according to measurements taken in 1851, I believe, after long drought, the ordinary volume is about 20 million gallons, occasionally in extreme years falling below that. I know that portion of the river between Arthington and Wetherby. The quantity of water flowing into it between those two points will certainly not be more than 3 million gallons in dry weather, and probably will be less. There can be no doubt, if this scheme is carried out, the volume of the Wharfe at Wetherby will be sensibly affected. There will still be enough for Mr. Coates, but the quality will be deteriorated, the volume of water being less, and the impurities which find their way into it the same. His pipe is inserted into a mill-race, the river being there dammed up for the purpose of conveying water to a mill, and, if the water is so far diminished as to draw down the level to any great extent, the pipe will be nearly exposed, and the present condition of things in dry weather would arise much oftener, and last much longer.

Cross-examined by Mr. CALVERT: I do not express an opinion as to how many times in a year it will affect him. I come here to express an opinion that, to abstract the water and to give a money compensation, is not the right way of treating the question. I do not say that it is not done sometimes, but not in cases analogous to this. I have not taken into account the water coming from the Dib reservoir. That is to provide compensation for water abstracted from the Wharfe when the Bradford Corporation Water-Works are in operation. That will be a difference in favour of the river, but not to the extent of 5 million gallons. The waters from that reservoir will be let in in flood-time. It may possibly make a difference of 2 million gallons daily.

Re-examined by Mr. CLERK: The Leeds corporation endeavoured to put such restrictions upon the sale of water at Bradford as would prevent the abstraction of water from the Wharfe, on the ground that they diminish the quantity and deteriorate the quality, which is the same objection which Mr. Coates now takes to this bill.

John Dyson, a waterman of Tadcaster, was examined to prove that since the Leeds corporation had drawn water from the Wharfe at Arthington it had effected a change in the navigation of the river, and that any further abstraction of water would be exceedingly injurious.

Mr. CLERK having addressed the committee, Mr. *James Knowles* the manager of Captain Gunter's estate, and Mr. *Hannan*, a surveyor of Wetherby, were examined in support of Captain Gunter's petition.

Sir *John Johnson*, M.P., was then called, and asked by Mr. RUSSELL whether he knew what the feeling of the inhabitants and proprietors of land on the banks of the river were, in reference to the present scheme?

The COMMITTEE, on Mr. CALVERT's objection, ruled that the question should not be put.

Mr. RUSSELL and Mr. CALVERT then addressed the committee, and the room was cleared for a few minutes. On the doors being opened,

The CHAIRMAN said, the committee are of opinion that the corporation of Leeds should be authorized to take from the river Wharfe, under this Act, a quantity of water amounting to 6 million gallons per day.

Mr. RUSSELL proposed a clause requiring the corporation to provide a compensation-reservoir, of a capacity to be settled by arbitration; and also to construct a gauge, in order to ascertain that no more than the specified quantity of water was abstracted from the river.

The CHAIRMAN said, the committee were not prepared to accept any clause for providing for the construction of a compensation-reservoir.

The clauses of the bill were then gone through. Several amendments proposed by the petitioners were rejected, and the bill passed.

Legal Intelligence.

COURT OF CHANCERY.

SATURDAY, MAY 10.

(*Before the* LORDS JUSTICES.)

SELBY *v.* THE CRYSTAL PALACE DISTRICT GAS COMPANY.

This was an appeal from a judgment of the Master of the Rolls, which was fully reported in this JOURNAL, on the 25th of March. The plaintiffs were the freeholders of certain lands, being part of Ravensbourne Park, Lewisham, on which various villa residences had been erected, and certain occupation roads let out for the use of the occupiers of the villas. Ravensbourne Park formerly belonged to George Selby (through whom the plaintiffs claimed) and Underwood Price, in undivided moieties; and in 1830 a deed of partition was executed, under which the roads were vested in Selby, he covenanting with Price and a then purchaser of part of the property, that they and the occupiers of the villas should have the same use and enjoyment of the occupation roads as if they were public roads. In July last, the occupiers of some of the villas invited the Crystal Palace District Gas Company to lay down gas-pipes for their benefit. This was done without the consent of the plaintiffs, who accordingly filed their bill to restrain the company from breaking up the roads for this purpose, and to oblige them to take up the pipes again. The Master of the Rolls held that the plaintiffs were prevented by the covenants in the deed from objecting to the occupiers having gas laid down by the company, and his honour therefore dismissed the bill. The plaintiffs now appealed from this decision.

Mr. LLOYD, Q.C., and Mr. A. SMITH, appeared for the plaintiffs; and Mr. SELWYN, Q.C., Mr. G. M. Giffard, Q.C., Mr. JESSEL, and Mr. FRANCIS WEBB, for the defendants; and Mr. WARE for certain parties claiming an interest as mortgagees in the land, and who were made parties to the suit.

Mr. LLOYD stated the circumstances of the case at great length, but it will only be necessary to give generally the drift of the argument. Having commented upon the judgment of the Master of the Rolls, he called attention to the covenant contained in the conveyance of the 9th and 10th of March, 1830, as stated in the bill, observing that much depended upon the construction which their lordships would put upon the terms in the deed. This deed recited that the land in Ravensbourne Park had been purchased by Price and Selby, for the purpose of building villas and substantial dwelling-houses thereon, and under an understanding that proper roads should be made, and for ever thereafter continued as such roads only for the accommodation of such villas and dwelling-houses. It also recited that they had agreed with Staley, to whom they had sold certain parts of the land, that he and the occupiers for the time being of such land, should at all times have a right of road and passage over and along all the said roads marked out as such in the plan, "in as absolute and complete mode of enjoyment as if the same were public roads." The deed contained certain covenants relative to these roads, the inheritance and freehold of which were vested in Selby, to the effect that "the said Underwood Price, his heirs, appointees, and assigns, and the owners and occupiers for the time being of all and every part of the said lands and hereditaments thereinbefore remitted to that use or for the benefit of the said Underwood Price, his heirs, appointees, and assigns, as aforesaid, and of all and every the messuages then or at any time thereafter to be erected and built thereupon, and their, and every of their relatives, friends, visitors, tradesmen, and servants, and other having business to transact with him, them, or any of them, either with or without carriages and animals of any and every description, should and might, from time to time, and at all times for ever thereafter at his, their, and every, of their own free will and pleasure, go, come, pass, and repass in, over, upon, along, and through all and singular, the said several roads marked out as aforesaid in the said plan, and have the full use and enjoyment of all and singular the said several roads in a full, free, complete, and absolute manner, to all intents and purposes whatsoever, as if the same were public roads." Having quoted the several other covenants, the learned counsel proceeded to observe that, at the time when the deed was made, there were entrance-gates erected, together with fences on each side of those gates leading to the private road in question from the public road, and that, at the other end of the private road, there was a stile and a thick hedge; so that, in point of fact, the place was a sort of *cul de sac*, having no thoroughfare to any other place. Subsequent to the execution of the deed, Staley disposed of the greater portion of his land, and Selby continued to remain in possession; and, several houses having been built on this private road, a letter was addressed, in the month of March, 1861, to the defendants by some of the occupiers of those houses, requesting that they might be supplied with gas, and stating that they were ready and willing to use and pay for a certain number of burners, which they specified. Amongst others who signed this document was Mr. Edward Selby, one of the plaintiffs, who signed as trustee of Trinity Chapel, having been requested so to do, and promising to take 12 burners. Upon that application, the gas company proceeded, in the month of July, 1861, to dig up the road; but, as soon as they had proceeded some distance with their work, they were applied to on the part of the plaintiffs, informed that the road was a private one, and they were requested to cease. However, they declined to do that; they laid down their pipes, and from that time to the present gas had been flowing through those pipes for the service of some of the occupants of the houses in question.

Lord Justice KNIGHT BRUCE: Have you not given compensation?

Mr. SELWYN: Certainly not, my lord, because we say it is our own land. It is our road for our purposes.

Lord Justice KNIGHT BRUCE: Then you allege that you have not touched the plaintiffs land?

Mr. SELWYN: We do.

Lord Justice KNIGHT BRUCE: Well, it is an odd state of things. Do you say that, even if the plaintiffs are right in their contention, no trespass has been committed?

Mr. SELWYN: We do. We contend that we have done no injury whatever.

Mr. LLOYD said, the allegation of his learned friend was this: that the plaintiffs were not occupiers, but only trustees for the benefit of persons who had houses on each side of the road; but that was in direct contradiction to the terms of the deed, which limited possession to Selby, and caused the latter to enter into covenants, whereby he was to enjoy possession of the road, in the same manner as if the same were a public road. In other words, the right to the soil was in Selby according to the terms of the deed, and, therefore, it was somewhat surprising to hear his learned friend setting up a claim, on the part of the defendants, to a portion of the land. Then, it was said that Selby was a trustee only of the soil. So far, no doubt; as the soil was a passage covenanted to be given to all the persons occupying houses on the land, Selby might be called, in a modified sense, a trustee for those parties; but it was an easement in point of fact, and the covenant conferred upon him the legal right to the soil, subject only to the keeping open of the passage.

Lord Justice KNIGHT BRUCE: What view of the case does Mr. Webb take?

Mr. WEBB: Of course, if it is a public road, we had an undoubted right right to lay down our pipes in it.

Lord Justice KNIGHT BRUCE: Do you apply for the appeal to be dismissed, with costs?

Mr. WEBB: Yes, my lord, that is our application.

Lord Justice KNIGHT BRUCE: You make use of the gas supplied by the defendants?

Mr. WEBB: Yes; and would be very sorry to lose it.

Mr. LLOYD said, the gas company were incorporated by an Act of the 21st and 22nd of the Queen, cap. 129. It was a private Act, but the General Gas Companies Act was introduced into it; and it was necessary that the attention of their lordships should be drawn to what it said relative to private and public roads, and compensation.

Lord Justice TURNER: Then, the General Act, as I understand you, was incorporated in the private Act?

Mr. LLOYD: Just so, my lord; and you will find that General Act in the 10th and 11th Vict., cap. 15. The terminology of the Act contains the interpretation clause.

Lord Justice KNIGHT BRUCE: I beg your pardon—what is "terminology?" (A laugh.)

Mr. LLOYD said, the 3rd section specified that the word "street" should include any street, court, alley, or public thoroughfare, within the limits of the special Act. The plaintiffs admitted that they were within the limits of the special Act; but, then, they contended that their's was not a public street. The power of laying down pipes was given by the 6th section, which said that, "the undertakers, under such superintendence as is hereinafter specified, may open and break up the soil and pavement of the several streets and bridges within the limits of the special Act," &c.; "and lay down and place within the same limits, pipes, conduits, service-pipes, and other works," &c. But, then, that general clause, giving powers for breaking up streets, was qualified by a proviso introduced into the 7th section, and which read as follows:—"Provided always, that nothing herein shall authorize or empower the undertakers to lay down or place any pipe or other work into, through, or against any building, or in any land not dedicated to public use, without the consent of the owners and occupiers thereof." Now, inasmuch as the defendants had not obtained the consent of all the owners and occupiers of the private road in question, it was clear that the Crystal Palace Gas Company had not a right to exercise the powers of the General Act.

Lord Justice KNIGHT BRUCE: As I understand you, the powers they exercised were entirely of a subterranean character?

Mr. SELWYN: That is so, my lord.

Lord Justice KNIGHT BRUCE: The company only light the inside of the houses. There is no lighting of the street?

Mr. SELWYN: No; there is no lamp in the road. It is a subterranean passage; and, from the pipe there laid down, the gas goes into the houses, and into the chapel.

Mr. LLOYD said that, at the time of the filing of the bill, there was no doubt that this was so. Looking, then, at the powers and provisoes in the Act, it was quite manifest the gas company had no right to enter upon this particular road at all, unless it were a public road. If, indeed, it were a public road, then their right was undoubted, provided they gave the general notice.

Lord Justice KNIGHT BRUCE asked, whether the opponents of the learned counsel contended that this was a public road?

Mr. LLOYD replied that no doubt they did. With reference to the occupiers of the houses who had sent the written notice, already referred to, to the gas company, the plaintiffs alleged that they (the occupiers) were the owners of a certain easement, which gave them no right whatever to disturb the soil.

Lord Justice KNIGHT BRUCE: Does Mr. Selwyn contend that the legal right to the road is not in the plaintiffs?

Mr. SELWYN: You see, my lord, the property is divided into thirds; that all the parties agreed to keep it in repair; and that these owners and occupiers do not claim under Selby. Then, with respect to the road itself, I say that it is immaterial whether it was a public road or not; because it was covenanted by the deed that it should be enjoyed in as absolute and complete a mode as if it were a public road. Then, we say that the plaintiffs have dedicated it, and made it to all intents and purposes a public road; that Selby could not devise it as if it were his estate; and then, we say further that beyond all doubt there was no injury whatever done the plaintiffs by us.

Lord Justice KNIGHT BRUCE: The last objection on the part of Mr. Selwyn is one of a very delicate description.

Mr. LLOYD said that, if he understood his learned friend aright, his argument was that it was matter of common agreement that the land should be vested in one of the three persons for the benefit of all. But, in conformity with the terms of the deed, how did that point stand? The deed declared that that portion of the land occupied by the road should be vested in Selby, subject to the covenant which expressly set forth the whole of the beneficial interest. This, then, was the state of the case, so far as the question of the right of ownership existed, as claimed by the occupiers of the houses; and it was principally with reference to this view of the matter that his honour, the Master of the Rolls, decided the question when it was before him.

Lord Justice KNIGHT BRUCE: Is his honour's judgment reported?

Mr. SELWYN: Yes; it has been very accurately reported in the GAS JOURNAL.

Mr. LLOYD here read long extracts from the judgment of the Master of the Rolls, and said the bill was dismissed with costs, in addition to which the plaintiffs had to pay the costs of some of the owners and occupiers of the houses.

Lord Justice KNIGHT BRUCE: The Master of the Rolls thinks that, according to the construction of the deed, the owners and occupiers of the houses had the same benefit in the road as if it were a public one. In fact, he says, it was a benefit usable by them in the same manner as if it were a public road. Is that not so?

Mr. LLOYD: No doubt, my lord, that is what his honour says; but we think him in error on that point.

Lord Justice KNIGHT BRUCE: It may be an erroneous view; but there is a plausibility about it, nevertheless.

Mr. LLOYD observed that the distinction between public and private roads was absolutely confounded in the judgment; because, although the Master of the Rolls admitted that he had satisfied his mind that this was not a public road, yet, in so far as the owners and occupiers of the houses were concerned, he held that it was to be considered as a public road.

Lord Justice KNIGHT BRUCE: I suppose he meant that it was not a public road for the gentlemen who carry about organs—(a laugh)—to go upon it uninvited.

Mr. LLOYD said, the principal question was the one now before the court—namely, was this a public road? He did not understand a public road, unless it was open to the public. There might be an arrangement between private parties that they should have as much enjoyment of a passage-way as if it were a public passage-way, but that would not convert it into a public road. A covenant or stipulation very often referred to a public road for the purpose of ascertaining the right of passage-way belonging to the public generally for public roads, but that did not alter the character of the road at all. Then, again, their lordships would observe that, although the term "public" road was used here, it was not used in a way to confer that character upon the road. It simply conferred on a private road the *quasi* character of a public one. It was to be *quasi* public for the owners and occupiers of the houses.

Lord Justice KNIGHT BRUCE: Yes, but the words of the deed are very peculiar. Those words are that the parties should "at all times for ever thereafter, at his, their, and every of their own free will and pleasure, go, come, pass and repass, in, over, upon, along, and through all and singular the said several roads marked out as aforesaid in the said plan, and have the full use and enjoyment of all and singular the said several roads in as full, free, complete, and absolute manner to all intents and purposes whatsoever as if the same were public roads." There the words are—"over, upon, along, and through." It seems to exhaust all the terms which would make it public.

Mr. LLOYD said that, no doubt the question might require to be discussed in this particular way—namely, whether the right of use to a public road was to be taken with reference to the right of use existing at the time the conveyance was made, or whether it extended to all time indefinitely? When reference was made to a public road for the purpose of ascertaining the nature and intent of what was given, then reference was made to what existed, not to that which might thereafter exist.

Lord Justice KNIGHT BRUCE: I should like to know whether the owners of these houses could not, if they were so inclined, call in the manager of a travelling theatre to perform for their amusement?

Mr. LLOYD said that, no doubt they could, but he himself would say to an orchestra of that description—"Pass on." He believed the whole difficulty in the present question had arisen from the use of the word "road" instead of "passage" in the deed, and that, had "passage" been used instead of the unintelligible word "road," the difficulty would not have taken place. Their lordships would see that the term "road" expressed an easement, and gave no right of digging up the soil or putting a spade into it; and he admitted that the persons who had a right to use the easement were entitled to use it to the extent indicated, but no further.

Lord Justice KNIGHT BRUCE: If the servants of the gas companies were litigious, which I suppose they are not, there would probably not be the same remedy against them in the case of a private road which there would be if they operated upon a public road.

Mr. LLOYD: I believe that is so. There is, however, a clause in the Gas Act itself, which says that a gas company entering upon a public street are bound to reinstate it in the same manner without delay.

Lord Justice KNIGHT BRUCE: I suppose so. I suppose, too, that that is sometimes done.

Lord Justice TURNER: Frequently not.

Mr. LLOYD said, that in the case of the private road in question, the plaintiffs would have no remedy to compel the company to reinstate the roadway; whereas, in the case of a public roadway, an adequate remedy existed. But, then, these were mere incidental views. What he had before submitted, and what now again he submitted was this: that the covenant only gave a right of passage, a right of enjoyment, *quasi* passage, as if this were a public thoroughfare; but, it did not follow that where an Act of Parliament was afterwards passed to give certain rights of digging up, and occupying the soil in the matter of public roads, its provisions came at all within the proper construction to be put upon a covenant which had reference to a private road. He submitted, under these circumstances, that the view of the Master of the Rolls could not be sustained upon a full discussion of the case. Not only did his honour seem to confuse the distinction between public and private rights, although admitting that the road in question was not a public one, but the manner in which his conclusion was arrived at did not certainly carry the mind along with it. In one part of the judgment, his honour said—"There are two clauses to the parts of the covenant, not merely that there is to be a distinct right of passage to and from the houses for the owners, and occupiers, and of persons who wish to go to them; but, in addition to that, there is to be the full use and enjoyment of the roads, in as complete a manner as if the same were public roads. Now, what does that mean? It means as if the same were public roads at the date of this indenture, and no other explanation is the proper explanation to be given." This was exactly what the plaintiffs contended for. All that was contracted to be given to Price and Staley was merely a right of road or passage; and very many of the words used in the deed were simply words of fuller explanation to the same effect. The main question remained, namely, whether there had been originally a dedication of the road in question to public uses? The answer to that would depend upon the nature of the evidence, and upon the fact whether there was evidence tending to show that there had been such a dedication.

Lord Justice KNIGHT BRUCE: You mean whether there had been a general absolute dedication of it to public uses?

Mr. LLOYD: Yes.

Lord Justice KNIGHT BRUCE: Then, you wish it to be decided that this road was thrown absolutely open to the public?

Mr. LLOYD: Yes; but then your lordship must recollect that that is the gas company's view of the matter. They will throw light, no doubt, upon that question by and bye, and, of course, they will endeavour to show that this was a public road to all intents and purposes. Heretofore have they brought forward two witnesses, to show that for twenty years and upwards, previous to the filing of the bill, this road was used by all persons indiscriminately, and that persons wishing to go to Brockley or to Ladywell in Lewisham, were seen to go along this road for twenty years and upwards? The plaintiffs answered—"be it so," but did that prove necessarily a public dedication of the road?

Lord Justice KNIGHT BRUCE: But it was for public transit, for persons desiring to go on foot, I suppose—not a thoroughfare for carriages?

Mr. LLOYD: No; only for foot passengers.

Lord Justice TURNER: There are six houses altogether?

Mr. JESSEL: Five, and the chapel.

Mr. LLOYD said he would now state the history of the road, and of the public pathway, as it was called. At the southern terminus of the private road, there were originally a gate and fence, put up to divide it from the public road. About fourteen years ago, that gate fell into a state of disrepair, and was taken away. Its re-erection had never taken place, because the parties could not agree among themselves as to who should be at the expense of making a new gate; but the matter of passage existed as much before as after its removal, and, in fact, that removal had not determined the question whether the road be or be not a public road. The learned counsel here described the opposite end of the road, pointed out the position of the houses upon the plan, and alleged that the defendants were mistaken in supposing that, for twenty years, the public had been in the habit of passing along the road in question. He submitted that the utmost use the public could have had with regard to the footpaths had been by way of sufferance, and not by way of the enjoyment of a right. He referred to the case of *Eaton v. the Swansea Canal Company* (17 Queen's Bench Reports, p. 267), and especially to the judgment of Justice Erle, who laid it down that "enjoyment" must not be clandestine, contentious, or by sufferance. Then, with regard to time, did the length of time during which the road was alleged to be enjoyed by the public furnish presumptive evidence of the enjoyment as of right? Upon this point, he would just observe that presumptive evidence was never resorted to when actual and positive testimony was obtainable. Now, the actual and direct evidence here told their lordships how the road had been created. That was done by means of a

covenant; and, the moment Selby entered into that covenant, it was not competent for him, as the owner of the soil, to dedicate it to the public at all. His (Mr. Lloyd's) opinion was, that it would be a departure from the terms of the covenant if Selby gave it to the public; at all events, the conclusion, by implication, at least, was inevitable, that a person who entered into a covenant to keep property private could not afterwards dedicate it to public uses.

MONDAY, MAY 12.

Mr. LLOYD resumed his argument, and said he should now only trouble their lordships with a few authorities. The first authority he would call attention to was: *The Trustees of the Rugby Charity v. Merewether* (which was reported in vol. xi. of East's Reports, p. 375), where judgment was given by Lord Kenyon. That had been followed by two cases, which seemed to be of considerable importance as bearing on the removal of the gate, and these were to be found in vol i. of Lord Campbell's *Nisi Prius* Cases. The first was *Roberts v. Carr*, which was a question of *quare clausum fregit*, tried in 1808; and the second was *Lethbridge v. Winter*. Then, there was the celebrated case of *Woodyear v. Haddon*, in Taunton's Reports, in which Justice Gibbs and Justices Chambers and Heath gave judgment, and also the Chief Justice (Mansfield). Then, there was the case of *The King v. the Inhabitants of Benedict* (vol. iv. of Barnewell and Alderson, p. 447). The next case to which he referred was *Wood v. Veale* (vol. v. of Barnewell and Alderson, p. 454)—a case of trespass, and justification under a public right of way, in which Chief Justice Abbott and Justices Bailey and Best gave judgment. He then quoted the case of *The Trustees of the British Museum v. Finnis* (vol. v. of Carrington and Payne's Reports, p. 460)—a case tried before Justice Paterson; and, lastly, he referred to vol. viii. of Adolphus and Ellis, p. 99, where the case of *Barrowclough v. Ellis* was reported. He submitted, upon the whole of the circumstances, that there had been no dedication to the public in the present case; that the private right to the road had been clearly established; that the Crystal Palace District Gas Company had invaded that right, and that the plaintiffs were entitled to have an injunction granted, in order to compel the company to remove the pipes already laid down, and to restore the land to its original position.

Mr. A. SMITH followed on the same side. He said, that the gas company in this case had perpetrated an act of very nearly force and violence.

Lord Justice KNIGHT BRUCE: Of course, the plea set up by the company is that this is to all intents and purposes a public road. The reply to that on the other side imparts to the case a serious gravity which perhaps might not otherwise belong to it.

Mr. SMITH said, the Gas-Works Clauses Act (10 and 11 Vict., cap. 15), sec. 8, prescribed that notice in writing should be given of breaking a street three clear days before commencing operations, and the 9th section provided that no such street should be broken up except under the superintendence of the officer of the company.

Lord Justice KNIGHT BRUCE: Then the company did not act under that clause?

Mr. SMITH: They did not.

Lord Justice KNIGHT BRUCE: Then what you say is, that by not giving the notice they acted unlawfully, even if the road were a public road?

Mr. SMITH: Just so, my lord. They took advantage of the absence of the plaintiffs, and proceeded to break up the road on the 16th of July. [The learned counsel here read the affidavits upon this point which had been made by Henry, Edward, and Frederick Selby.]

Lord Justice KNIGHT BRUCE: I think I understand you to say that the company illegally, in not having given the necessary notices, even assuming the road to be a public one?

Mr. SMITH: Yes, my lord; but, if it were a public road, I admit that they might have broken it if they paid £5, or something of that sort, for their neglect in not giving the people notice. The question was raised before Vice-Chancellor Wood.

Lord Justice KNIGHT BRUCE: Are the houses in the road in question supplied with water?

Mr. SMITH: Yes.

Lord Justice KNIGHT BRUCE: By pipes laid under the road?

Mr. SMITH: Yes; but that was done by the express permission of all the parties.

Lord Justice KNIGHT BRUCE: Could you not arrange this difficulty?

Mr. SELWYN: I am afraid not, my lord. You see Mr. Selby wants to make a profit by charging us so much for his royalty.

Lord Justice KNIGHT BRUCE: It is a question of difficulty, but could it not be arranged? I think it would be for the benefit of every one if it could be arranged. At the same time, if it cannot, we must only deal with it as well as we can.

Mr. SMITH: I agree with your lordship that it would be very desirable if it could be arranged that these roads are not public roads.

Lord Chief Justice KNIGHT BRUCE: Yes; but that is the serious part of the question. Do the mortgagees take any part in this dispute?

Mr. SMITH: They take part with the plaintiffs.

Lord Chief Justice KNIGHT BRUCE: I take it for granted that if a man happens to live in one of these houses, all his relations have a free passage to him.

Mr. SMITH: Oh, no doubt. I may mention to your lordship that it was upon the second clause of the deed, his honour, the Master of the Rolls, decided against us. But I submit that if there was any ambiguity in that clause, it has been cleared away by the recitals, and that the owners and occupiers were to have certain advantages, but not collateral advantages.

Lord Justice TURNER: The words of the covenant are—"full use and enjoyment."

Mr. SMITH: Yes, my lord; but that was a right to the surface, but not to go below the surface. [The learned counsel here quoted some of the authorities which had been previously referred to by Mr. Lloyd, and contended that there must in this case be evidence to show that there was an intention on the part of Selby to dedicate the road to public uses.] He called upon their lordships not to presume intention, but to have positive proof of it.

Lord Justice TURNER understood Mr. Smith to contend that the existence of the covenant showed that there was no such intention.

Mr. SMITH replied, that this certainly was part of his argument. He then called attention to various passages on this point in the affidavits made by the Selbys.

Lord Justice KNIGHT BRUCE asked, what the whole army of affidavits on both sides amounted to?

Mr. SMITH replied sixteen; and said that, according to the positive swearing of the Selbys, the road was a private one, and had been violently broken up by the defendants.

Lord Justice KNIGHT BRUCE: Were the houses lit with gas?

Mr. LLOYD: Oh, yes, my lord; I believe, on the very night the street was broken up.

Mr. SMITH, having read through the whole of the remaining affidavits, concluded by asking their lordships to grant a mandatory injunction to restrain the defendants, and to oblige them to remove their pipes.

Lord Justice KNIGHT BRUCE: What have the mortgagees to say?

Mr. WARE: I appear, my lord, for the mortgagees, who have not joined in the appeal.

Mr. SELWYN said he appeared on behalf of the gas company in this case who had been dragged into this litigation, in consequence of having complied with the request of the persons, or a very large proportion of the persons, who occupied houses in the street in question. The case had been before Vice-Chancellor Wood on three occasions; and surely it was high time now that there should be an end put to litigation so vexatious. If the court were to entertain cases in which the parties had no legal rights to stand upon, they would have enough to do.

Lord Justice KNIGHT BRUCE: I presume, it is a case which might be settled without much difficulty.

Mr. SELWYN: I cannot say, my lord, how that is. There is no injury done by us to the parties, as a proof of which, the plaintiffs only want £10.

Lord Justice KNIGHT BRUCE: If the question of a public road were taken out of the case, then it might be settled without difficulty. Mind, however, that I do not say it should be taken out of the case.

Mr. SELWYN: Allow me to tell your lordship that we have repeatedly said to these persons—"If you have suffered any injury, bring an action at law." They know very well that if they did so, they would not get any damages; and yet they come here to make this court the instrument of oppression. These persons endeavour to distort the language of the deed. The ornamental piece of ground was vested in the testator for the benefit and accommodation of all the persons interested in the joint speculation of building villas; and yet here they come forward now and say: "You shall have neither gas, nor water, nor sewers, unless you pay me." Let your lordships observe the circumstances in which this matter stands. Here was a property which belonged to three persons. It was a building speculation. It was allotted in certain shares to the three, and then there were certain portions which were to be allotted for the benefit of all. Is it likely that the owners of two-thirds of the property would place themselves at the mercy of the owner of one-third, and enable him to say that that they should not have any gas or water except with his consent? It is obvious that the parties would not do anything of the kind.

Lord Justice KNIGHT BRUCE: Suppose we should be of opinion that the plaintiffs are right, does an injunction follow?

Mr. SELWYN: Certainly not. I say they have no right to ask for an injunction, seeing that no injury has been done them. In the case of Baron Rothschild, and in a variety of other cases, it was decided that substantial injury will always meet with redress, but I presume this court will never consent to take imaginary grievances of this kind into consideration, and that it will never interfere where no substantial damage has been done. As I said before, they know themselves that they have no possible chance of getting any damages in a court of law.

Lord Justice KNIGHT BRUCE: What did Vice-Chancellor Wood say?

Mr. SELWYN: Why, nothing my lord.

Mr. LLOYD: He drew up an order, and after that the case was consigned to the Rolls.

Mr. SELWYN: Yes; and this is the first time we have been heard in our defence.

Lord Justice KNIGHT BRUCE here read the order of Vice-Chancellor Wood.

Mr. SELWYN continued: When the case came before the Master of the Rolls, and when it was objected that the defendants had been guilty of an interference with private property, his honour dismissed the case, with costs. Upon that occasion, the defendants had simply appeared, and were not called upon for their defence. The principal point, after all, was, whether any sane man would enter into an undertaking whereby one individual, who possessed only one-third of the property, should be at liberty to oppose his wishes to those who held two-thirds of it. Even supposing there should be any doubt as to the construction of the deed, what must, *ex necessitate*, have been the feelings of the owners of the two-thirds when they entered into the speculation? His learned friends on the other side could not deny that the road was to be open for the accommodation of all visitors to the houses of the owners and occupiers; but, then, it was alleged that that accommodation was only over the surface of the roads at the time the deed was executed. Still, they had not ventured to argue that the visitors were not entitled to pass and repass over, upon, and along the said road. They had, indeed, faintly attempted to argue that there was some discrepancy between the recitals and the operative part of the conveyance; but he (Mr. Selwyn) was in a position to show that no such discrepancy really existed: and he would observe at once that where the operative part was clear, it could not be controlled by the recitals. The learned counsel having here read the recitals, commencing with the general recital, proceeded to say that, although in the dark ages gas and water might be set down as nuisances, many of our Acts of Parliament, in this more enlightened age, set forth that gas and water were real necessaries; that both were of a most important and useful nature; and, after that, we were not to be told, in a court of justice, in a day like the present, that gas was a nuisance, and that it ought not to be supplied for the accommodation of villa residences. And, though his learned friends might call it a nuisance, he should like to ask them whether they had ever heard of an instance in which any one who had ever introduced that description of light into his dwelling had banished it afterwards? It was true, there might still be persons who had not experienced the benefit of gas, and who might prefer candles; but he apprehended that the inhabitants of Ravensbourne Park were not of this benighted order, for they had requested the company to supply them with gas, and the company had supplied them at their own special invitation, which invitation, by the way, was signed by one of these very plaintiffs himself.

Lord Justice KNIGHT BRUCE: How are these houses to be drained, if the allegations of the plaintiff are correct?

Mr. LLOYD: It is only lately, my lord, that drainage, except by means of cesspools, was adopted.

Mr. SELWYN presumed his learned friends would say that the improved system of drainage was also a nuisance. But the real question was, were the owners and occupiers to be bereft of the benefits of both gas and water, unless Mr. Selby was paid what he chose to exact?

Lord Justice KNIGHT BRUCE: Did the three parties join in bearing the expenses of the road?

Mr. SELWYN: Yes, and all are equally liable.

Lord Justice KNIGHT BRUCE: Suppose they should omit to perform that duty, how would it be then?

Mr. SELWYN: Then each of them would be liable for any injury which might accrue, by reason of the non-performance of that duty.

Lord Justice KNIGHT BRUCE: Has any of the property been sold out and out by any of them?

Mr. SELWYN: Yes; Mr. Mayne bought Mr. Staley's portion; and let me say here, that there are other persons infinitely more concerned in the settlement of this question than the gas company—namely, those who purchased the property, and who all contributed to make the roads, and covenanted to keep them in repair. Referring again to the full and explicit terms of the covenant, I would venture even to ask Mr. Archibald Smith, whose ingenuity no one can for a moment deny, whether he could draw any covenant which could convey a more undisputed right of passage over, along, and upon this identical road?

Lord Chief Justice KNIGHT BRUCE: There are, no doubt, some very clear propositions in it, such as "on" and "upon," but it does not follow that these convey the right of making a subterranean passage.

Mr. SELWYN: But the declaration goes on to extend the right to "lands and hereditaments," and land is land open to the centre of the earth. So water goes and sewage, for the use and benefit of the inhabitants in the villas.

Lord Justice KNIGHT BRUCE: Can a person who has to interpret this deed, decide against the introduction of gas, without, at the same time, deciding against water and sewage?

Mr. SELWYN: Of course, he cannot. I confess, that after carefully looking at the provisions contained in this deed, I think it would be monstrous to grant any injunction which would have the effect of restraining us in a case so clear, so useful, and so necessary. The case is, indeed, plain enough. There is no ambiguity whatever in the deed. The recitals of it are as complete as the operative part; and, I humbly submit that your lordships can have no difficulty in deciding the question, because to all intents and purposes this was a public road with a public right of footway.

Lord Justice KNIGHT BRUCE: Does the road include the footway?

Mr. SELWYN: It does, my lord.

Mr. Jessel, Mr. Giffard, and Mr. Webb followed on the same side.

Mr. LLOYD replied; and the case was adjourned for the judgment of the court.

FRIDAY, JUNE 6.

Lord Justice KNIGHT BRUCE gave judgment this day. He said, the principal or sole object of this suit was to obtain an injunction to prevent the defendants, the Crystal Palace District Gas Company, from laying down gas-pipes under certain roads in Kent, and breaking the surface of those roads, the prayer of the bill being thus:—"1. That the defendants, the Crystal Palace Gas Company, their agents, servants, and workmen, may be restrained by the order and injunction of the honourable court from entering upon and breaking up the said roads, except so far as may be necessary for the purpose of taking up and removing the pipes which have been, as aforesaid, laid down thereunder; and from allowing any of the said pipes to remain in or below the surface of the said roads; and from allowing any gas to flow through the said pipes; and from allowing any part of the said roads which have been broken up by the said company, or which may be broken up in the process of removing the said pipes, to remain open or broken up, or otherwise than in its original condition; and that the said company may be ordered to remove the said pipes, and to restore the said land to its original condition. 2. That the defendants, the Crystal Palace District Gas Company, may pay the costs of this suit. 3. That the plaintiffs may have such further or other relief as the circumstances of the case may require." The roads to which the suit relates, and in the surface and soil of which the plaintiffs claim to be interested, are or were private, or in a sense private, and for the use and enjoyment of them, according to a provision made by a deed of the 10th of March, 1830, mentioned in the bill. The plaintiffs insist that the roads are still private roads under the deed, and according to its terms. The defendants, the gas company, however, contend that by dedication they have become public roads, and with the persons who, though not parties to the bill, have been allowed to appear in this cause as if they were parties, insist that, whether the roads are public or private, the company's Acts, of which the bill complains, and against which it seeks an injunction, were and are authorized and lawful. This the plaintiffs deny. The Master of the Rolls dismissed the bill, and the matters which were before him, and are before us, appear to me such as plainly to render one of two courses right—namely, dismissal of the bill, or permission to the plaintiffs to bring an action for the purpose of trying the question of right, the bill being retained in court for a twelvemonth with a view to that object, and the suit to be dealt with after the plaintiffs' failure to sue in due time, or their success or defeat in the action, but without any injunction in the meantime, my reasons being the very slight nature, as it seems to me, of the damage done, and likely to be done, by the company's works—the object of those works—the circumstances in which they began, and, while continuing, were continued—the language of the deed already mentioned, and the doubt whether the roads have become or have not become, by dedication or otherwise, public roads. I think it not clear upon the evidence that the plaintiffs have the alleged right, upon the supposed existence of which the bill proceeds, and that the case is one in which more inconvenience and more damage would be caused by granting an injunction erroneously, than can be caused by refusing or delaying an injunction erroneously. My impression, however, is against the dismissal of the bill at present, and is in favour of the other of the two courses that I have mentioned. But, I repeat, that an injunction at present is, even on that theory, in my judgment impossible; and, if the Lord Justice (Turner), agreeing with the conclusion of the Master of the Rolls, shall hold that the dismissal ought to remain undisturbed, so, of course, it will be.

Lord Justice TURNER said, the bill, in this case, is filed by the devisees under the will of George Selby against the Crystal Palace Gas Company, and against several persons who are mortgagees of the plaintiffs; and the bill alleges that the plaintiffs, as the devisees of George Selby, are entitled to certain private roads leading from the highway into certain lands called Ravensbourne Park; and it further alleges—"The plaintiffs, Frederick Selby, Alfred Selby, Henry Selby, and Edward Selby, reside on the said lands; and the defendants, the Crystal Palace District Gas Company, well knowing that plaintiffs objected to the said roads being broken up, and such pipes laid thereunder, and that they would not allow the same to be done, took advantage of the plaintiff, Edward Selby, being from home, and of the plaintiffs, Frederick Selby, Alfred Selby, and Henry Selby going to London daily on business; and on the said 16th of July, 1861, the servants or agents of the said company, having collected a large number of workmen, entered upon and began to break up the said roads as soon as the said last-named plaintiffs had set out for London, and laid down and covered in a considerable number of the said pipes in the course of that day;" and, therefore, the bill prays for an injunction. Upon the cause coming on before the Master of the Rolls, on motion for decree, his honour, considering that the interests of the occupiers of the houses mentioned in the bill might be affected by the decree to be made, ordered the cause to stand over, and notice of the proceedings to be given to those occupiers, and they having, accordingly, appeared at the hearing, his honour ultimately, by decree, dated the 10th of March, 1862, dismissed the bill with costs. The appeal before us is by the plaintiffs, from the dismissal of the bill. The ground on which the Master of the Rolls proceeded in dismissing the bill, as I collect from his honour's judgment, was in substance this—that, notwithstanding these roads might be private roads vested in the plaintiffs—and his honour, without deciding the question whether they were so or not, so treated them for the purposes of his decision—they were, by force of a covenant contained in a deed I am about to mention, and by which the plaintiffs were bound, to be deemed and taken to be public roads, so far as the use and enjoyment of them by the occupiers of the houses mentioned in the bill were concerned; and that those occupiers, therefore, were well entitled, as against the plaintiffs, to have the roads broken up and the pipes laid down, for the purpose of having gas introduced into their houses. This view of the case renders it necessary carefully to consider the covenant in question, and examine the deed in which that covenant is contained. It states—"That he, the said Underwood Price, his heirs, appointees, and assigns, and the owners and occupiers for the time being of all and every part of the said lands and hereditaments thereinbefore limited to the use or for the benefit of the said Underwood Price, his heirs, appointees, and assigns, as aforesaid, and of all and every of the messuages and dwellings then or at any time thereafter to be erected and built thereon, and his, and their, and every of their relatives, friends, visitors, tradesmen, and servants, and others connected or having business to transact with him, them, or any of them, either with or without carriages, and animals of any and every description should and might from time to time, and at all times for ever thereafter, at his, their, and every of their own free will and pleasure, go, come, pass, and repass in, over, upon, along, and through all and singular, the said several roads marked out as aforesaid in the said plan, and have the full use and enjoyment of all and singular, the said several roads in as full, free, complete, and absolute manner to all intents and purposes whatsoever as if the same were public roads; and that he, the said George Selby, his heirs, appointees and assigns, would, at all times thereafter, keep and continue such parts of the said lands and hereditaments thereinbefore limited to his and their use and benefit as aforesaid, as are in the said plan marked out for roads, as, and for such roads only for the mutual use and benefit of the said George Selby, Underwood Price, and James Staley, and the owners and occupiers for the time being of all, and every part of the said closes, lands, and hereditaments, thereinbefore mentioned and described, and the villas and dwellings then, or at any time thereafter to be erected and built thereupon; and in the said indenture of appointment and release were contained certain covenants and provisions for the repair of the said roads, at the joint expense of the the said Underwood Price, George Selby, and James Staley, and their respective heirs, appointees, and assigns, or the owners and occupiers for the time being of the said messuages and lands, thereby limited to uses for their respective benefit, as by such identures when produced will appear." The first question which has presented itself to my mind on considering this deed has been, whether the lands marked out as roads were intended by this deed to be conveyed, or were conveyed, by it to George Selby as beneficial owner in part of the lands to be taken by him in full for his undivided moiety, or whether they were not intended to be, and were not vested in him merely in order that the roads might be made and maintained? The recitals of the deed are very peculiar in this respect. They are, that such of the lands as were thereinafter limited to the use or for the benefit of Price in severalty should be taken in full for his undivided moiety of all the lands, and that such of the lands as were thereinafter limited to the use or for the benefit of George Selby in severalty should be taken in full for his undivided moiety of those lands; and then, that it had been also agreed that all the roads marked out as such should be conveyed or limited to Selby, his heirs appointed and assignees—the word "roads" as there used meaning, as I conceive, the land marked out as roads, there not being in the deed any conveyance to Selby of roads *qua* roads; so that in this part of the deed there is, as it seems to me, a distinction drawn between the lands to be conveyed to Selby in severalty in full for his moiety, and the lands marked out as roads. Proceeding, then, to the operative part of the deed, the same distinction appears to me to be still kept up as to the lands marked out for roads. The conveyance to Selby is of the lands coloured blue, which are particularly described as consisting of specified quantities of building land and ornamental ground, and then by a separate description also of the lands marked out for roads, and to be always continued as such as aforesaid. Looking at this deed, therefore, in both its parts, I am very much disposed to think that the lands marked out as roads were not intended to be, and ought not to be, held to have been conveyed by it to Selby in part of his undivided moiety, but ought to be held to have been conveyed to him only for the purposes of the roads. This construction is no doubt open to the difficulty that it cannot be said that the lands marked out for roads are not conveyed to George Selby in severalty, and that it must be admitted, therefore, that they fall within the description of what he was to take in part of his share; but, although they fall within the words, they do not, I think, fall within the meaning of the description, for they are not conveyed to him to be dealt with as he may think fit, but for the specific purpose of the roads being made and preserved. I have thought it right to consider this point, as it seems to me to bear materially upon the covenants contained in the deed; for, if the lands marked out as roads were not conveyed to George Selby in part of his undivided moiety, the covenants entered into by him must be looked at as covenants so entered into by him, not as beneficial owner of the soil, but as the holder of it for the benefit of himself and of the other persons interested under the covenants; and a more liberal construction in favour of those other persons may, as I apprehend, well be given to the covenants in the latter than could properly be given to it in the former view of the case. Whether these covenants, however, are to be looked at in one view or the other, it is upon the terms in which they were expressed that the question I am now considering must depend. In whatever point of view the case is looked at, the lands marked out as roads are most certainly vested in George Selby; and, if taken by the plaintiffs at all, were taken by them subject to the grant, reservation, covenants, stipulations, provisoes, and agreements, in the deed contained; and by the deed George Selby covenanted that the owners and occupiers of every part of the lands limited to the use or for the benefit of Price, and of all and every the messuages and dwellings then, or at at any time thereafter, to be built thereupon, should have the full use and enjoyment of all the roads in as full, free, complete, and absolute manner, to all intents and purposes whatsoever, as if the same were public roads. These words seem to me to import that the several persons referred to in the covenant were to have all such use and enjoyment of these roads as they could have had if they were public roads, more especially having regard to the immediately preceding words of the covenant, which provide, in the most extensive terms, for the

rights of transit. It was argued for the appellants that the use and enjoyment of the roads must mean the use and enjoyment of them *qua* roads, for the purpose for which roads are ordinarily used—the purpose of transit; but, if the use and enjoyment covenanted for are the use and enjoyment of the roads as if they were public roads, and if, being public roads, they could be used for other purposes than the purposes of transit, I do not see my way to cut down the effect of the general and extensive words of the covenant, so as to confine them to the purposes of transit only. It was argued for the appellants that no such rights as now exist on the part of the gas company existed at the date of this deed, and that the covenant ought to be confined to such rights of user of public roads as then existed; but the covenant extends to the full use and enjoyment of the roads as if they were public roads from time to time, and at all times for ever hereafter, and I think, therefore, that it extends to new modes of use and enjoyment of public roads arising after the date of the deed. It was also argued for the appellants that the meaning of the covenant was open to doubt; that the recital, therefore, must be called in aid to construe it, and that, according to the recital, the agreement between the parties applied to the rights of transit only; but, assuming that the recital may be taken into account, it does not seem to me to aid the appellants case, for, according to the recital, the roads are to be continued by the appellants for the mutual use and benefit of Selby, Underwood, and Staley, and all the other owners and occupiers of the houses for the time being, in the most complete mode of enjoyment, as if the same were public roads. It was further urged for the appellants that, it was not within the meaning and intent of the covenant that the rights of the persons entitled to the benefit of it should be blended with the rights of the gas company; but, as I read this deed, the occupier of every house was to have the full use and enjoyment of the roads as if they were public roads, and I think, therefore that every such occupier takes, under the deed, the right to call in for any purpose of use or enjoyment which he may desire to have, all such aid as he would be entitled to call in if the roads were public roads. I agree, therefore, with the Master of the Rolls, in the construction which he has put upon this deed, and, as the gas company have laid down these pipes at the request of the occupiers of the houses, and, would have been entitled to lay them down if the roads were public roads, I am of opinion, without entering into the other questions which were argued at the bar, that this bill was properly dismissed with costs. The plaintiffs, in fact, in my opinion, have instituted this suit in contravention of the covenant by which they are bound. My learned brother, however does not, I believe, take the same view, or, at all events, so strong a view of the construction of this deed as I have taken; and I think, therefore, the appeal should be dismissed without costs.

Mr. WARE asked, whether the occupiers would be allowed their costs?

Lord Justice TURNER replied in the negative.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

CITY COURT OF SEWERS, GUILDHALL, TUESDAY, JUNE 3.

At the Meeting of the Commissioners held this day—Mr. DE JERSEY in the chair—

Mr. DAW (the chief clerk) read a letter from the Great Central Gas Company stating, in answer to complaints respecting defective lighting in the public lamps, that "this company's fittings were clear, and that there was plenty of gas in the services."

Dr. ABRAHAM asked, whether any communication had been had with the gas companies relative to the pulling up of the streets for the purpose of removing old service-pipes?

The CHAIRMAN said, there had not. At the last court, the inspectors were directed to report the number of trenches which had been opened, and those reports when brought up would be referred to the General Purposes Committee, who were examining the whole subject.

Dr. ABRAHAM said, what he desired to know was, whether the companies had any legal right to do as they were doing? In Bishopsgate alone they had opened between 700 and 800 trenches for the purpose of taking up disused services, and it appeared to him that they were not justified in thus dealing with the public streets. From the best information he could obtain, he gathered that some ten or twelve years ago the Great Central Gas Company laid down a large number of service-pipes speculatively, and, finding them now useless, they were removing as many of them as they could. He thought they ought to have waited until the streets were broken up for other purposes, as they were often required to be. Independently of the interruption and annoyance occasioned by these numerous trenches, there was great damage occasioned to the pavements by the stones being chipped and cracked in removal and replacement. He had asked the question three weeks ago, and moved that the matter should be referred to the solicitor for his opinion as to whether the gas companies were justified in the course they were pursuing, and he had not had a reply yet.

The CHAIRMAN referred to the minutes of the court, and said it appeared from them that Dr. Abraham's resolution did not speak of obtaining the opinion of the solicitor on the subject, but of the committee taking the conduct of the gas companies in opening the streets into their consideration. The committee to whom the question was referred had thought it desirable to have the whole of the facts before them, and one of those facts—a very material one—was the report of the inspectors as to the number of openings made in the various streets by the gas companies.

Dr. ABRAHAM said, that was not his motion. His motion was to take a legal opinion upon the subject, in order to ascertain whether the companies had not exceeded their powers.

The CHAIRMAN said, the minutes were read and confirmed at the meeting subsequent to the passing of the resolution, and could not be altered now. It was quite open to Dr. Abraham to move anything further on the matter. He (the chairman) understood the reference to be to the committee, who would take a legal opinion if necessary.

Mr. DAW said, he had mentioned the matter to the solicitor, who would be quite prepared to advise the committee, if required to do so.

The CHAIRMAN said, the committee would meet again in a few days, when the subject would be gone into.

Mr. J. YOUNG said, he always understood that, after the gas companies opened the streets for any purpose, they relaid the pavements temporarily, and that the contractor to the commission subsequently made them good at the expense of the company. Probably, Dr. Abraham was not aware of that fact.

Dr. ABRAHAM said, he was aware of it, but he thought it necessary that the attention of the court should be called to the circumstance of no less than a thousand openings having been made by the gas companies in one district alone. He had seen broken and chipped stones laid down, and had had several of them taken up again in his own locality; and, unless the commission adopted the same course in all the districts, the City would be the losers by this conduct of the companies.

Deputy HARRISON said, he thought there was some mistake as to this general breaking up of the streets, because one of the large stones in front of his house had been removed, which could not be necessary for the purpose of taking up a "speculative" supply-pipe. The matter required a little inquiry, because there was great inconvenience arising from this course.

Dr. ABRAHAM said, the trenches were made wherever there were duplicate pipes, and he believed it was not the act of one company, but of all.

Deputy HARRISON said, he understood that the supply of gas to the City would eventuate in a districting arrangement under the Act of Parliament, but he thought the companies ought not to anticipate by a year the carrying out of that arrangement, by this general taking up of duplicate pipes. He could not at all tell the object, and, therefore, the matter should be inquired into. In the case of damaged pipes, there was some reason in the proceedings of the companies; but this was something beyond that, and he hoped the committee would take it into their serious consideration.

The CHAIRMAN said the committee were quite alive to the subject, being aware of the great inconvenience to which this general disturbance of the streets gave rise. Without foretelling what the committee would do, he might assure the court that they were prepared to go into the matter very fully, and ascertain what were the rights of the company, and every other point.

Mr. C. YOUNG said, when Dr. Abraham's motion was before the court, he himself asked whether the committee had power to take the opinion of the solicitor, and was assured by the chairman that they had. It was on that account, he supposed, that the words were ommitted from the motion.

The CHAIRMAN said, whether he made that statement or not, it was certhat the committee had the power, and that they would exercise it.

The reports of the inspectors were subsequently brought up and read.

Inspector MORTIMER reported, that in the south district, the Great Central Company had opened 289 places, for the disconnexion of unused services, since the 1st of May. The company's men had been closely followed by the contractor, and the pavements made good. In answer to Deputy Waterlow, the inspector said that no pipes had been removed for the purpose of transferring the supply of gas from one company to another.

Inspector TERNOUTH reported, that in the north-west district, 273 trenches had been opened by the Great Central Company, and 33 by the Chartered Company, since the 1st of April. In answer to the chairman, he said that most of the services were laid down some years ago, in anticipation of supplying gas to the houses, but had never been used. In some cases, the services had been rendered useless by the transferrence of the supply to another company; but these were not recent changes.

Inspector PAINTER reported that, in the west district, since the 11th April, the Great Central had opened 411 trenches. In all cases, the pavements had been reinstated. The Chartered Company did not supply gas in this district.

Inspector WILLIAMS reported that, in the east district, since the 1st of April, the Great Central Company had opened 781 trenches, and the Chartered, 120.

Inspector FLOOD reported that, since the 1st of April, the Great Central Company had opened 479 trenches in the foot-pavement, and 299 in the carriage-way; and that the Chartered Company had opened 92 in the pavements, and 84 in the roadway; making a total of 954 in the north-east district.

Mr. HAYWOOD (the engineer) suggested that the inspectors should be directed to report upon the condition of the pipes removed; it would be found, he thought, that many of them were in a very bad state.

The CHAIRMAN directed the inspectors to be prepared to lay before the committee, at their next meeting, a list of the streets in which the trenches had been made, and the number of trenches in each.

THE GAS EXPLOSION IN SHOREDITCH.

INQUEST ON THE BODY OF HANNAH SMITH.

On Saturday, May 31, an inquest was commenced at the London Hospital, before Mr. HUMPHREYS, one of the Coroners for the County of Middlesex, on the body of Hannah Smith, who was killed by an explosion of gas in Church Street, Shoreditch, on the afternoon of Wednesday the 28th ult.

Serjeant BALLANTINE, instructed by Mr. Price, solicitor, attended with Mr. R. JONES, civil engineer, to watch the case on behalf of the Commercial Gas Company, the breaking of whose main was the cause of the explosion; Mr. BATTEN, of the firm of Swift and Co., attended for Mr. Brassey, the contractor for the main-drainage works now being executed through Church Street. Mr. PODMORE, solicitor, watched the case on behalf of the husband and friends of the deceased; and Mr. J. T. MOSS, solicitor, for several parties whose houses had been damaged by the explosion. Mr. C. SALISBURY BUTLER, M.P., chairman of the Commercial Gas Company was also in attendance.

The jury having been sworn, proceeded to view the body. On their return, the following evidence was given.

Samuel Smith: I reside in Turville Buildings, Church Street, Shoreditch, and am a labourer. The deceased, who was 43 years of age, was my wife. I last saw her alive on Wednesday morning at 5 o'clock, when I went to my work. She was then quite well. I know nothing about the occurrence of the accident.

Richard Bunn: I reside at No. 2, Wood Street, Hackney Road. I am a smith by trade, and am deputy engine-keeper. On Wednesday last I was in Church Street, shortly after 5 o'clock, and was kneeling on the water-main, helping to put on a service to Mr. Priddy's house. At that time the main was shaking from the working of the double-action engine, which was about 200 feet distant from where I was at work. I said to Oakley, the waterman, "this main will go down." The main was in the cutting which had been made for the new sewerage works going on there. I then got out of the cutting, and as soon as I had done so the engine nearest towards me made a shoot towards the left side of me towards the houses. I was then on the pathway. Directly the engine fell, there was a rush of people away from the spot. I went as far as the corner of Brick Lane, where Oakley stood, and he told me to go round the other way and see what was the matter. I did so; and, on the other side of the cutting, I saw that the beams which supported the pipe and the engines had given way. I ran back to Oakley, and told him to shut down the main, or it would all go in together, as the weight of stone on the pavement had driven all the stones and the kerb into the cutting. The stones or "pitchers" which had been taken up out of the road had been piled up on the curb; there was a great quantity of them. As soon as I got back to Oakley, the explosion took place. I waited till the dust and smoke had cleared away, when I saw some timber lying on the lighted gas. The gas was burning underneath the paving. Seeing that, I ran and

fetched my engine. When I returned, I saw the deceased woman. A young man had hold of her under her arm-pits, and was taking her from between the stones of the paving. All her clothes were burned off her, and she was naked. There were some sacks put upon the burning gas, and I pumped water upon them. I afterwards saw the deceased carried away on a shutter. I had not smelt any escape of gas before the engine fell. I should say that the accident arose from the continual beating of the double-action engine, which caused the beams on which it rested to go down, and this caused the fall of the engine and the cutting.

By Mr. BATTEN: The explosion caused the destruction of the house, No. 151, Church Street. The double-action engine was not 50 feet from that house. The engine which fell over was directly opposite to it. I believe, the bank fell in from the motion of the furthest engine. The bank was made with brattice-work sides, which were supported in their places by struts running across, upon the top of which was a railway on which the engines travelled. The water-main was suspended in the cutting by chains, which were attached to the beams. When the engine fell over, the struts had given way, and a portion of the brattice-work had fallen into the cutting. That was before the explosion had taken place.

By Mr. PODMORE: There was no escape of gas before the sides fell in.

By Mr. BATTEN: About a yard of the earth of the bank fell into the cutting. I cannot tell how much fell into the cellar of the house. I had not passed over the pavement in front at any time previously that day. I saw it afterwards when I was at work with the engine, and, likewise when the deceased was being taken out. The cellar had then all fallen in. I should think three or four minutes elapsed from the time the engine fell over before the explosion took place.

By Mr. PODMORE: The "pitchers" were piled up on the pavement nearly as high as myself. I think if I were to say there were 20 tons weight of those stones, I should not be wrong. I did not smell any gas at all before the engine fell over; I smelt it afterwards. I had been at work there about ten minutes.

By the JURY: I am not aware that there is an old main, or an old service belonging to the gas company in the Curtain Road underneath the place where the explosion took place. If there is, it must have been down for some time.

A JURYMAN: It has not been used I believe for twenty-three or twenty-four years.

By the CORONER: I had not passed through the street before that day. I was there the day before. I did not smell any gas then.

By the FOREMAN: I am not aware that one of the workmen left the cutting some time before the accident, saying that he would not stop there because there would be an explosion. I was not aware that he got his tools together and drew his money, because he was threatened with being discharged if he mentioned it.

By the JURY: The gas-main was situated, as near as I could tell by examining it after the explosion, a little way under the kerb; about 4 feet from the house. The ends of the timbers which lay across the cutting, and which supported the longitudinal timbers on which the engines travelled, must have rested over the gas-main. The timbers which went across the cutting were about 16 inches in thickness, and they rested over the edge of the cutting about 18 inches—rather further than the kerb I think, but am not quite certain. I do not know the thickness of earth and brickwork between the cutting and the interior of the vault of the house.

The CORONER: Do I understand that you say from your own knowledge that those cross pieces of timber go over the gas-pipe?

Witness: I rather think they do.

Mr. BATTEN: My instructions are positive that they do not.

The CORONER: I will take it as he gives it, "I rather think they do."

Examination continued: I do not know whether this pipe was hung up with a chain, or whether it was visible before the explosion—I did not see it.

George Oakley: I am a turncock in the employ of the East London Water-Works Company. On Wednesday last, a little after five o'clock, I was on duty in Church Street, and was called by one of the inhabitants to give her a supply of water a second time, as her pipe was cut off by the sewer-works. I went inside the hoarding for the purpose, and the plumber belonging to the contractor called me, and asked me to stop a few minutes while he got the gutta-percha pipe laid on to give them a temporary supply for the afternoon. I waited about a quarter of an hour, and then went to see whether the cock was sound. While I was opening the cock, the plumber came up and said—"You must shut up your large 15-inch main directly, for we shall have the whole down, as the land is giving way at the side of the cutting." I sent a man to see what was the matter, and he told me the stones were falling into the cutting, and the gas-main was broken. Immediately afterwards I heard the explosion. The gas-main was under the ground; our main was supported by chains. I was standing opposite where the explosion was, and I saw that the footway by the house that fell had sunk about 7 or 8 inches while I was talking with the plumber. I do not know what caused it to fall. I had been about the place for three or four hours. I did not detect any smell of gas until I was shutting off the 15-inch cock. I do not know whether any of the workmen had knocked off work on account of an alleged escape of gas. I had not smelt any the day before. I did not notice, prior to the explosion, whether the wooden walls of the cutting had fallen inwards or towards the houses. The ground had partially sunk about 7 inches. I saw that three of the baulks of timber which supported our main, after the explosion, had given way, and dropped down. I did not observe the effect produced upon the brattice-work.

By Mr. BATTEN: It was about three or four minutes before the explosion that I noticed the pavement had sunk and was sloping towards the cutting. It seemed to be at right angles to the house, but, when the cutting dropped in, the kerb and all was gone. My impression is that all fell in towards the house. If the cellar underneath the pavement had fallen in, I think it would have presented the same appearance.

Mr. BATTEN: The gas-main ran underneath the kerb?

Witness: Yes.

Serjeant BALLANTINE: But you have not got it that the gas-main runs over a cellar.

Mr. BATTEN: But, looking at the plan put in, would that correctly represent its position?

Serjeant BALLANTINE: It would not, according to your theory.

Mr. BATTEN: I have no doubt the plan is correct.

The CORONER: The serjeant does not doubt that his plan is correct, but he doubts the accuracy of your theory.

Examination continued: I do not believe that the bearers rested upon the gas-main, but over it. I believe they did not rest upon the kerb, but I will not swear to it. At the time of the accident, there were three engines all at work. On the engine opposite the house, I noticed the driver and a boy.

The FOREMAN said he wanted to show that the timbers which supported the brattice-work were resting entirely on the earth, and that if the friction of the engines caused the earth to cave, down they must go. He thought it a most indiscreet way of putting them up.

Mr. BATTEN regretted that the foreman should express an opinion at this stage of the proceedings that the contractor was doing the work badly, seeing that by and bye he would have to give a verdict in the case.

By the JURY: The wooden walls were formed of timbers 1½ inch thick, and about 9 feet long. If they had been 12 or 14 feet long, I think there would have been a better chance of avoiding accident. I do not think the men at work in the cutting could see the gas-main; I do not know whether they were aware of its existence there. They always ask me what water-pipes go up the road, and I tell them. I know that the gas company have persons there who could give such information about their mains as might be required by the contractor for the sewers. I have seen them there. I believe the weight of the stones upon the footway and kerb were the cause of the accident. The gas-main is about 12 or 15 inches under the surface of the ground. There is a vault underneath the pavement, and the main is close against it. There may be a distance of 2 feet 6 inches between the ends of the timbers and the vaults. The struts are driven in as tight as possible, so as to prevent the earth falling into the cutting. That may have a tendency to drive the 2 feet 6 inches of earth into the vault. I should say it would shake it; and the weight of stones on the top, together with the shaking of the engine travelling over the surface, would cause the earth to give way; and, giving way, it would fall, of necessity, upon the pipe, and break it.

John Hayes: I lived in the house, No. 151, which has fallen. On Wednesday afternoon last I was outside my premises, and observed that the footpath was slanting out towards the kerb, and was sinking. A relay of men was sent round to remove some of the paving-stones which had been piled up on the kerb; but they had not moved more than a dozen when the explosion took place, and I saw no more till I found myself at the corner of Mr. Tidbury's shop, three or four doors from my house. I was driven there by the explosion; and one of the men who had been moving the stones was knocked up against me. There was a dark cellar under the pavement in front of my house, but I cannot say whether it had a vaulted or a flat roof. I never kept anything in it. It is about 4 feet high beneath the pavement, and runs about 5 feet underneath it—nearly to the kerb. There was a tremendous lot of "pitchers" piled up on the pavement. They were piled up 4 or 5 feet, and in some places 6 feet high; and my opinion is, that the weight of those stones, and the strain of the engines working, caused the earth to fall into the cutting. Previous to going out of my shop, I saw the men at the engine turn all pale, and I ran back to my wife and told her something was the matter. Directly I got outside, I saw the pavement going down. There were three men on the engine; one working it, and one at each side of the pole that steadies the bucket which comes up from below with the tub of dirt. The engine, before it was moved, was inclining towards my house, because the pavement was sinking on that side. It was slightly out of the upright when I saw the men turn pale; but, before it sank far, there was the explosion, and I could see nothing for the dirt and smoke; in fact, the air was quite dark. When I went to examine the vault under the pavement, the day after the explosion, I found it was all driven into the cellar beneath the house. My wife was blown one way by the explosion, and I another; and she made her escape through the cellar of Mr. Gerard's house into Swan Street. I did not hear any order given to the men to remove the stones before the explosion, but I suppose they were ordered or they would not have begun to do it. A fowl was found behind my house yesterday with marks of fire upon it, which I attribute to the explosion; but my firm conviction is that the fire commenced in the front of the house.

By the FOREMAN: Previous to the stones being piled up in front of the house, there was no examination or inquiry made by the contractor's men as to whether there was a vault under the pavement. The vault was intended for a coal-hole, but there was no opening into it from the street. The thickness of the brickwork of the roof was about 2 feet 6. I never gave it a thought that there was danger in piling such a weight of stones on the pavement. I did not hear one of the contractor's men say that the ground was sinking at 12 o'clock that day.

TUESDAY, JUNE 3.

Mr. KARSLAKE, Q.C., and Mr. LEMPRIERE attended for Mr. Brassey this day.

The jury proceeded at half-past nine this morning to view the scene of the accident, and were engaged on the spot for two hours. On reaching the inquest room,

The CORONER said, in consequence of the death of Mr. Wakley, the coroner for the western division of the county, and the duties of that gentleman's office devolving on him, he should only be able to give a short time to the inquiry this day, and, at the rising of the court, the proceedings would be adjourned to the following Monday at his chambers.

The first witness called was

George William Wright, who said: I am a bellows-maker, and reside at 148, Church Street. On Wednesday last, about five o'clock in the afternoon, my attention was aroused by observing confusion among the men at work at the sewer, and, shortly afterwards, a Mrs. Manning told me the pavement was sinking, and asked whether I thought it was safe. While I was talking to her on the subject, the explosion took place. I did not see the deceased woman, as my attention was directed to the sinking pavement. It was receding, not towards my house, but towards the cutting; and I saw the men begin to remove the stones which had been piled on the kerb. I did not notice any escape of gas that day until a few minutes before the explosion. I consider that the weight of stones placed upon the arch was the cause of the accident. The baulks of timber, which ran transversely, and carried the tramway for the engines, rested upon 12 or 14 inches of earth outside the kerb. One or two of them supported the chains which held up the water-main. I cannot say, from having seen it myself, whether they had given way on one side before the explosion; but any reasonable being would say they must have done so. When I observed the confusion among the men, I saw that the engines were being shifted, and, when I came on to the pavement in front of my house, I could see the reason in a moment: it was, because the pavement was giving way. No inquiry was made of me before the stones were piled up on the kerb in front of my house. I have cautioned the men not to place too much weight there, as I considered it was dangerous; and I have always been laughed at.

By Mr. KARSLAKE: I cautioned a man named Lund, but he told me it was not his business to "ax" the neighbours whether there were any vaults under the pavement. I cautioned him long since—two or three weeks ago.

By Mr. MOSS: One of the engines was moved about fifty yards, just before the accident. The working of the engines produced great vibration and noise, shaking my house and windows, and keeping me in continual fear. The men that I have cautioned were in the employment of the contractor. When I spoke to them about it a week ago, one of them said if my house was waxed together it would fall, but if it was properly built it would stand.

The pile of stones was about 9 feet 6 inches, or 10 feet from the front of my house.

William Brown: I am an excavating labourer; and live in Mark Street, Paul Street, Finsbury. I was employed by Mr. Brassey, and was at work in the cutting on Wednesday last. About twelve o'clock that day, I saw the ground giving way opposite the house which has fallen down. It was then setting down from 2 to 3 inches from the pavement, and towards the cutting. I did not communicate that fact to anybody; it was not required; for the timber men, with the ganger, were then busy at the place, using all their endeavours to keep the ground up; but the overweight was too great, and it had gone too long. The cutting was begun last Monday morning week, when the men were taken off their other work. There were two or three clerks of the works, but it was not my place to make any communication to them on the subject. On the Thursday after the accident, I told Mr. Blundell that I had seen the ground shifting at twelve o'clock on the Wednesday, and he told me not to open my mouth too wide. I said I did not know that I had said anything out of the way, except between ourselves. That was about half past six o'clock on the Thursday morning; and, as I was going home to breakfast, I said to one of our gangers that I would go back and get my ticket, and tell them that I would not stay any longer on the works. I discharged myself. When I was shifting the engine back on the Wednesday evening after the accident, I said to one of the engine-drivers—"This ground has been shifting since twelve o'clock to day." He made answer, and said—"For God's sake, don't put that about; for, if you do, all the expenses will fall upon Mr. Brassey.

By Mr. Moss: The earth was taken away too fast, and there were not enough timber men.

By the Coroner: After the settlement of the ground at twelve o'clock, the engine continued working.

By the Jury: There were two or three frames of timber wanted at twelve o'clock, in order to make it right. They were not able to do what was needed because of the want of hands.

Monday, June 9.

The inquiry was resumed this day, at Mr. Humphreys' Chambers, Spital Square.

The Coroner said, he proposed to take the evidence of only one more witness as to the facts, and then leave it to the learned gentlemen, who represented the various parties, to call what evidence they thought proper.

Serjeant Ballantine said, on behalf of the Commercial Gas Company, he proposed to call one or two witnesses to speak to the condition of the main, and to afford the jury any information they might desire respecting it.

Mr. Podmore said, that Mr. Brassey, sympathizing with the misfortune which his client had sustained in the loss of his wife, had, without admitting any legal liability, paid the funeral expenses of the deceased, and made such provisions for the family that he should not think it necessary to watch the proceedings any further on his behalf.

Mr. Karslake said, it was quite true that Mr. Brassey, deeply regretting the occurrence although not admitting any legal responsibility, was most anxious to mitigate the sufferings of those who had been bereaved by this sad calamity.

Mary Smith, of 47, Church Street, was then called. She said, my attention had been directed to the woodwork which supported the cutting, and, on the Wednesday afternoon prior to the accident, I saw that it was giving way, and that the earth was bulging out directly opposite Mr. Hayes's house. That was about half-past five o'clock; and, before I could speak to my daughter about it, the accident took place. I had noticed it before, and spoken of it in my family, but not to any of the workpeople.

Alfred Tidbury: I am a baker, and reside at 154, Church Street, and occupy the vaults of the two adjoining houses. A night or two before the accident, I told the watchman to ask the foreman of the works to come down and see my vaults, as I considered they were not sufficiently strong to bear the weight of stones that were placed upon them. He did tell him, and the reply I had was, that the more they put upon them the stronger it would make them. I saw the stones in the street about ten minutes or a quarter of an hour before the accident took place. Over the part that I complained of, I should think there were 50 or 60 tons of stone—there might be 100 tons. They were piled 5 or 6 feet high opposite my neighbour's house, but not so high in front of mine. I fancied I saw a crack in my vault, and that was the reason I told the watchman.

By the Jury: No one came to see my vault. There is a large crack in it now. It did not fall in, because the men took all the stones away the night after the accident.

Mr. *George Bainbridge:* I am the surveyor of the parish. At the time the workmen commenced the cutting at Brick Lane, I gave notice to the foreman to remove all the stones off the pavement, and to put them down a side street, because of the annoyance they were to the inhabitants. I had received a great many complaints concerning the stones; parties had been up to the vestry to complain. My notice to remove them was not given in consequence of apprehension of danger. I knew there were vaults along there, but I did not know of the existence of the one that fell in.

The Coroner: Did you examine the way in which the earth was sustained and kept up?

Witness: Yes.

The Coroner: Have you any observation to make about it?

Witness: No, sir, none at all; it was shored up very well indeed. I made an examination of it the day before the occurrence. I am on the sewers every day.

Examination continued: I have examined the premises since that time. In my opinion, the accident was caused by the weight of stones upon the vault, and there being no support underneath. There were about 20 or 30 tons of stones piled on the pavement, and the walls of the vault were not strong enough to sustain the weight.

By Mr. Karslake: I have been surveyor in chief for six months, and have been engaged in the parish for four years. I did not know of the existence of this vault, though I did of those adjoining. I have examined it since the accident and find that it was very badly built, and the mortar had perished. It was originally a very weak structure. I have not gone into any calculation of the weight of stone on each square foot of pavement. I guess that there were 20 or 30 tons there.

Robert Jones, Esq., examined by Serjeant Ballantine: I am the engineer of the Commercial Gas Company, and have been for a number of years consulting engineer to a great many gas companies. The Commercial Gas Company superseded the Chartered Company in this district about twelve years ago At that time, there was a main lying there which is the one to which reference has been made by the jury. About seven or eight years ago I laid it dead, that is, I cut it off from all connexion with our main, and left it without gas. The main which gave way was in a perfectly sound and good condition, and no complaints have been made to us relative to any escape of gas from it.

By Mr. Karslake: I had seen the main before, but not stripped for any distance in this part of the street. I may mention that the old main of the Chartered Company, which had been laid dead, was being removed in sections, as the sewers men opened the ground. The age of the main that was broken by the accident was about 14 years. It was not laid by me, and I only know its age by hearsay. The life of mains depends very much upon the nature of the soil in which they are laid. It is not an unusual thing for them to last 40 or 50 years in a good state. I do not know whether this was a new main when laid down.

By Serjeant Ballantine: I have been to the scene of the accident since the explosion occurred, and have examined the main. I found it had been broken evidently by some crushing weight—I should suppose by the weight of stones piled over it. No inquiry had previously been made at our office as to the position of our main.

By the Foreman: The only dead main in that locality was the one I have spoken of, and which was being removed from time to time, as the ground was laid bare. I was going to remark, that there exists a system with contractors—I do not mention names—of doing their work without first ascertaining the position of the mains in the locality.

Mr. Karslake objected, that the practice of other contractors was not evidence in this case.

By the Jury: Previous to the accident, I had made no examination whatever of the cutting; and, therefore, I do not feel competent to answer in any way as to the distance between the timbers which supported the earth and our main. I had never had any communication with the contractors.

The Coroner summed up the case. After reading over his notes of the evidence, and commenting upon it, he said there could be no doubt that the unfortunate deceased received the injuries which resulted in death from the explosion of gas caused by the breaking of the main, owing to too great a weight of stones being placed on the pavement above it; and it would be for the jury to determine whether there had been such an amount of criminal negligence on the part of the contractors in carrying out their works as to make them legally responsible. If they were of that opinion, they would have to say whether any party was liable on a charge of manslaughter. If, on the other hand, they thought the calamity had arisen from unavoidable circumstances, their verdict would be one of accidental death. In considering the question, they must discard from their minds altogether the question of damage. With that they had nothing to do, the remedy being in another court. All they had to regard was, the cause of this poor woman's death, and whether that cause was attributable to such an amount of negligence as to make the parties responsible on a criminal charge.

The jury retired, and, after an absence of about 20 minutes, returned into court, and delivered the following verdict—"We are of opinion that the deceased, Hannah Smith, came to her death from injuries resulting from an explosion of gas, which explosion was caused by the gross negligence of the sewers contractors."

Serjeant Ballantine said the remark which the engineer of the gas company wished to make, although it could not be given in evidence, was important, and might be extremely useful. There were many instances of explosion of gas, which unfortunately resulted in loss of life and great injury to property, arising from the circumstance that the contractors for such works as these would not take the trouble to inquire of the different gas companies where their mains were laid, and avoid doing anything immediately above the spot which was calculated to fracture them.

The Foreman: We quite agree with your remark, I assure you.

At the meeting of the Metropolitan Board of Works, on Friday last, Mr. Bazalgette, the engineer, made a report upon a letter received from Messrs. Peek and Downing, on behalf of Mr. Manning, claiming compensation for damage by the gas explosion in connexion with the middle-level sewer-works in Church Street, Shoreditch; and on letter from Mr. Wright, No. 148, Church Street, requesting that his premises might be repaired. He stated that, having made a careful examination of the premises shortly after the accident, he could not agree in the verdict of the jury, that it was attributable to the negligence of the contractor. He believed that it arose from the defective and dangerous condition of the house itself, which, with the vault beneath, was built with bad bricks, without bonding, and that the mortar had perished. The trench for the sewer-works had only been sunk 10 feet, and was well timbered; the engine was not resting on the vault which gave way, but opposite to the house. The stones were only piled up to the height of 4 feet, and in the manner which for many years past had been usual, so as to form a fence between the footway and the cutting. The weight of stones so piled up had been greatly over estimated, and, in his opinion, any vault which would not carry such a weight ought not to exist beneath a public thoroughfare. The contractors in executing such large works through the streets were greatly cramped for room, and required space for bricks and other materials, and also for depositing the earth taken out of the cutting. In order to obtain this, and at the same time to keep the thoroughfare open, every available spot was occupied, and it was very difficult in all cases to avoid accident. He recommended that the claims for compensation be referred to Mr. Brassey, the contractor, who, if these claims could be sustained, would be liable under his contract with this board. The report was approved.

WESTMINSTER DISTRICT ROARD OF WORKS.

MR. HUGHES AND HIS CONSTITUENTS.

Pursuant to a requisition signed by five members, a Special Meeting of this Board was held at the offices, Great Smith Street, on Friday last, the 13th inst., to elect a member of the Metropolitan Board of Works to represent the Westminster District at that Board, Mr. Samuel Hughes's term of office having expired. The chair was taken at three o'clock by Mr. Mallock, and there was a large attendance of members.

Mr. Scudamore asked to be informed why a special meeting on requisition had been convened for the purpose of the election; and why the notice of the vacancy had not been inserted on the agenda paper in the ordinary way?

The Chairman said he believed the precedent which was set on the occasion of the first election of Mr. Hughes had been adopted in the present instance.

The Clerk (Mr. Jebb) read the notice from the Metropolitan Board of Works to the district board, apprising them that Mr. Hughes had ceased to be a member by efflux of time.

Mr. Scudamore proposed the re-election of Mr. Hughes; and, in doing so, said that gentleman had represented the district with honour and credit for the last three years. He did not think the slightest imputation could be cas upon Mr. Hughes for any neglect of duty; and, as to his special fitness for the post, there could be no question. His professional ability, and scientific

attainments, well qualified him to take his seat at a board to which was confided powers second only to those of the Imperial Parliament. He hoped that all personal feelings would be discarded by the members, and that they would consider that they had a duty to perform to the district, and to the metropolis at large; and that was to send up the best man to represent them at the Metropolitan Board.

Mr. YOUNG seconded the motion.

Mr. BIGG moved—"That Mr. Taverner J. Miller, M.P., be elected the representative of this board." He said he had not a word to urge against Mr. Hughes as to his ability or fitness; but there was one objection which he must reluctantly mention, because the matter had been publicly brought forward in the parishes. It seemed to him to be very important that every member of this or other boards should be free from all suspicion of seeking his own interest in the performance of his public duties. (Hear, hear.) He thought it very unbecoming that any gentleman elected to fill a public office should make a claim for any pecuniary reward on account of the services he performed. He would not say but what Mr. Hughes might have rendered important services to the parish; probably he did; at all events, he would take it for granted; but it was never understood or supposed that those services were to be rewarded by a pecuniary payment. Certain it was that if it came to be considered that gentlemen could seek pecuniary recompense for services rendered to the board, their character as a public body would be very much lowered in the eyes of their constituents. In thus expressing his own opinion, he believed that he uttered the sentiments of the majority of the board. (Hear, hear.) He had not a word to utter in disparagement of Mr. Hughes on any other ground. In reference to Mr. Miller's qualifications, he felt that there would be no difference of opinion, and he had pleasure in proposing that gentleman, from the circumstance that on a former occasion he had taken a contrary course. At that time, Mr. Miller was considered by many members fully competent for the office, and there were a considerable number of votes in his favour. It was very desirable that they should elect, as their representative to the Metropolitan Board, a gentleman of position. The powers of that board were increasing to an extent which, in the estimation of many persons, was very alarming, and they certainly made very heavy demands upon the ratepayers. Mr. Miller was a gentleman of position and influence; he had resided for many years in the neighbourhood, and there was no other man so likely as he to serve the board effectually. Having made the reference he had done to the reasons which induced him to object to Mr. Hughes, he would only further express a hope that in any discussion which might follow, personal matters would be avoided. The objection which he had stated was one of a public nature, and all he could say was, that if the board should be of opinion that those who worked with them had claims for pecuniary reward, then the reason which he had stated would have no weight with them. If, on the other hand, they felt as he did, that the board should be free from the risk of imputation that the members sought their own private advantage in the discharge of their duty, they would express that opinion by voting for Mr. Miller. In what he had said, he designed to cast no imputation upon Mr. Hughes's character; it was a question of principle entirely, and it was desirable to adhere to that.

Mr. THOMAS HORN, in seconding the nomination of Mr. Miller, said he had no wish to disparage the services or the abilities of Mr. Hughes, who had so assiduously laboured and so successfully acquired a notoriety on all questions respecting gas. But, as there were other interests equally affecting the well-being of the metropolis, he thought the board had done well in looking round for a gentleman to represent them whose mind was unshackled from prejudices connected with this vexed question, and who would take a more comprehensive view of the requirements of the district.

Mr. LOWNDES, in supporting the nomination of Mr. Miller, said, that when the first election of a representative to the Metropolitan Board took place, he was one of a deputation appointed to wait upon that gentleman to ask him to accept the office, if elected. He (Mr. Lowndes) voted against the other candidate, the late Mr. A. Wright, of whose merits he then knew nothing, but in whose success he afterwards rejoiced, for he found him to be a man of ability and character, and one who served the district well. He felt that they had now an opportunity of electing Mr. Miller, who would protect their interests, and be a good representative both in and out of Parliament, and, therefore, he was most happy to support his nomination.

Mr. HUGHES said, he regretted that the other candidate was not present, because he felt a delicacy in addressing the board in his absence. As, however, there had been some remarks made personal to himself, he must ask permission to say a few words. (Hear, hear.) Mr. Bigg appeared to labour under some misapprehension in the view which he took of the matter, in which he said that he (Mr. Hughes) had received remuneration for his services. It was distinctly understood, when those services were rendered, that he was retained professionally for the parish. He appealed to the recollection of all the gentlemen who attended the board that day; he appealed also to the solicitor, with whom he had not had a word of conversation on the subject since, whether it was not a perfectly understood thing that he was retained professionally on the occasion referred to? The circumstances were very peculiar. It was sought to rate a very important company at a very much larger sum than that on which they were then assessed, and questions involving very large interests, and very intricate calculations, arose out of it. They were not questions requiring his time for a few hours, or a day in a week. Such services as those he had rendered freely to the board ever since its commencement, and for such services he would never have dreamed of claiming the smallest remuneration. But, the services referred to occupied him day after day—the whole of his time for several weeks, and not only his own time, but that of the assistants in his office. The account which he sent in was not purely for his own time; probably half of it was for payments to other persons, and, therefore, he was afraid the whole thing had been misunderstood by those gentlemen who supposed he had sent in a large claim for personal services. Another circumstance was this. The mode of rating large companies was one to which he had given much attention; it was one upon which lawyers and the highest authorities were very unsettled in opinion. It would be in the recollection of Mr. Rogers how many interviews were required to be had with counsel—in fact, those services were as infinitely beyond the general services which men rendered in a public capacity as could possibly be conceived. He consulted his friends on that occasion, for he had thought at one time of sending in an account only for money actually paid out of pocket, but he was advised by his professional brethren that they had always charged for such services when engaged by their parishes; and one of them referred to a heavy rating case in which he, as a member of the Fulham board, was consulted, and in which he had felt it right to charge for his services. When this subject was discussed in the Metropolitan Board, in consequence of remarks made in the vestry, several members—barristers and others—told him that he was perfectly justified—in fact, that it would be unprofessional not to charge for those services. He had expected on this occasion to be objected to on other grounds, and it certainly astonished him that this matter should be raked up after such a lapse of time. He felt that he was now on his trial, and he certainly should like to have it stated more specifically what were the reasons which induced honourable members to reject a representative whom they sent willingly to the Metropolitan Board three years ago. When it was proposed to dispossess a gentleman of an office which he had held for some time, it was usual to point out some fault committed or some duty neglected. He could conscientiously lay his hand upon his heart and say that he had most faithfully served the district; and, since he had been a member of the Metropolitan Board, he had attended 81 out of 130 board meetings, besides numerous committees, which he believed was considerably above the average attendance of members. He was not aware that he need refer to any other point, but he would be happy to answer any charge which might be brought against him.

Mr. SHEDLOCK said he was sorry to contradict the statements made by Mr. Hughes. That gentleman told them that, three years ago, he was sent willingly to the Metropolitan Board; but the fact was, the mode in which that election was carried out reflected no credit at all upon Mr. Hughes at that time. Then, it appeared Mr. Hughes was so very innocent, that he actually thought the vestry employed him in a professional character to represent the parishes. He (Mr. Shedlock) denied it, and he wished to put his denial on the broadest possible ground, so that there should be no evasion, and no doubtful terms employed at all. He had consulted the minutes of the vestry, and was prepared to prove what he said. On the 19th of April, 1859, a committee was appointed for the purpose of attending to the appeal of the Chartered Gas Company against their assessment to the poor-rate. The parish had assessed them at £9000, having previously rated them at £4600. Mr. Hughes was churchwarden and overseer at that time; and it was his duty, being a vestryman, and appointed on that committee, to attend to the duties referred to it. As churchwarden and overseer, the duty was cast upon him by the parish to attend to the rating, and to see that the inhabitants, and all other parties, were properly assessed. Mr. Hughes was appointed, together with Mr. Godson, Mr. Clarke, Mr. Hartley, and Mr. Elliott, on the committee. The latter did not attend any of the meetings. Mr. Hughes attended the first meeting, on the 26th of May, 1859, there being present Mr. Godson and himself only, and they came to a resolution, that Mr. Charles Penfold be retained to advise on the case, and more especially to prepare suggestions for the cross-examination. At that meeting (Mr. Hughes and Mr. Godson only being present), it was also resolved that Mr. Hughes was to apply himself to the question of the several accounts, and as to the legality of the rating, with a view to prepare such evidence as might be necessary. He had never been retained by the vestry for the purpose, and the only retainer he had was one from himself. It was a very common thing for a member of a committee, who might be supposed to know some special department of a question better than another, to have that department left in his hands. But, was Mr. Hughes retained as an engineer? If he had any claim at all against the vestry, it must be as a solicitor or accountant. But it appeared that Mr. Rogers had the conduct of the case, and his bill as solicitor amounted to £315. How it was that Mr. Hughes and Mr. Godson could adopt such a resolution as the last one he had referred to, he was at a loss to conceive. If he was retained to apply himself to the accounts, he must charge not as an engineer, but as an accountant. There was, however, nothing in the resolution retaining his professional services, as Mr. Penfold, who was a surveyor, was to advise upon the case. In April, 1860, there was another meeting of the committee; and who did the board suppose was present? Mr. Clarke and Mr. Hughes. It was then resolved that the services of Mr. Lee (an eminent surveyor, and well fitted to give advice, and support the case of the parish), and, if necessary, Mr. Ashman and Mr. Arntz, should be retained against the gas company's appeal, and to assist Mr. Penfold and Mr. Hughes to establish the rate. What retainer was there by the vestry? Mr. Hughes appointed himself! It seemed, however, that they were ashamed to let the resolution appear with only Mr. Hughes's and Mr. Clarke's names; and, therefore, it was carried round to two other members, who, though not present when it was passed, signed it the next day. When Mr. Hughes said he was retained by the vestry as engineer, and was thus entitled to charge for professional services, he (Mr. Shedlock) begged leave to say it was contrary to the fact.

Mr. HUGHES: Look at the bill, and see.

Mr. SHEDLOCK said, Mr. Hughes misunderstood him. He did not say that he had not charged for services as an engineer, but that he had never been professionally retained as such, and, if he had a right to charge at all, it was as an accountant. He (Mr. Shedlock) objected to these charges before the poor-law auditor, and, when he did so, even Mr. Godson said—"I was not aware of such an account, but I think Mr. Hughes ought to be paid." With respect to the other member of the committee, Mr. Clarke, when he was told there was such an account, he appeared to be quite amazed, and said—"I only wish I had not left the parish, that I might oppose it—it takes me quite by surprise; I had no idea Mr. Hughes was to charge in that way." Such being the case, how could that gentleman say that he was retained by the parish? Then, Mr. Hughes had just stated that the greater portion of his account was for money paid out of pocket—but what were the facts? The claim he sent in was for £233. 15s. Mr. Penfold, who was professionally retained, was satisfied with £117; Mr. Lee, with £61; Mr. Ashman, with £43; and Mr. Arntz, with £18. 18s. It might be said that Mr. Hughes's services were so much greater, and, therefore, he ought to have more. The rating appealed against was that of 1857, and Mr. Hughes was on the committee which raised the assessment of the gas company from £4600 to £9000; and it was mainly on his supposed knowledge, and the information he gave the committee, that the increase was made. He told them there was no question at all but that they could establish a rating of £10,000, but they were perfectly safe in making it £9000. They made it £9000; the company appealed; it went to arbitration, and the arbitrator awarded £7000. Surely, if his services were so eminently valuable, he would have advised them to assess the company at £7000, instead of £9000, in the first instance; but it was quite clear he was mistaken. And this was not the only thing of which he complained. These matters occurred in the vestry, and it might be supposed that this board had nothing to do with them. But he would go a little further, for he felt that it was very desirable indeed that they should send some one to the Metropolitan Board whose veracity they should not have to question.

Mr. HUGHES: Veracity?

Mr. SHEDLOCK repeated, whose veracity they would have no right to question, and he would explain, in order that Mr. Hughes might have all the credit to which he was entitled. Now, he did question the veracity of Mr. Hughes. At a meeting of the Metropolitan Board, in January 1861, Mr. Hughes made three statements or rather misstatements, which he (Mr. Shedlock) would now read. On that occasion, Mr. Hughes said "the £220 paid to him by his vestry had no connexion with the Metropolis Gas Bill." Very true, but here was the point. "He had been employed on the distinct requisition and resolution of his vestry, on a most laborious case connected

with the rating of a public company." He (Mr. Shedlock) had read to the board from the minutes of the vestry, and he would ask was there anything in them at all like "a distinct requisition and resolution" for employing Mr. Hughes? He had carefully extracted from the minutes every thing in connexion with this subject, and if he had not given the precise words of those minutes, he had given the substance of them. The report of Mr. Hughes's speech proceeded thus: "Which resulted in the assessment of that company being raised from £4600 to £9000, and by which more than £700 a year was put into the pockets of the parish." He (Mr. Shedlock) denied it, for as he had stated, the effect of all Mr. Hughes's services with those of the other gentlemen combined, was that the assessment was increased to £7000. It was true the vestry subsequently rated the company upon an assessment of £9000—(Mr. Hughes: "Hear, hear")—the gas company offered to pay on £8000 and £9000 for the two subsequent years, but they were assessed by another committee at £9000. And why? Not on account of Mr. Hughes's services.

Mr. HUGHES: Yours, probably.

Mr. SHEDLOCK: No doubt of it, but I have not been paid for them.

Mr. HUGHES: You don't deserve it.

Mr. SHEDLOCK said he would show presently how it was. He was not in the habit of going behind people's backs and taking money from their pockets; he did it openly, and not surreptitiously. The assessment of £9000 was agreed to because the company had districted since the former assessment, and the Chartered Company had more property in the parish in 1859 than they had in 1857. He would appeal to Mr. Rogers whether that was not a part of the arrangement?

Mr. ROGERS: No doubt of it?

Mr. SHEDLOCK asked, what then became of Mr. Hughes's statement, that "£700 a year was put into the pockets of the parish?" (Hear, hear.) Mr. Hughes went on to say in the same speech before the Metropolitan Board—"He need scarcely say that the vestry paid his charges very cheerfully and readily, the advantages of his labours being so great." (Loud laughter.) One would suppose that the matter was unanimously agreed to, whereas, on the first occasion of its being brought forward, it was adjourned; and, on the second, was carried by 13 to 10. It was surprising that Mr. Hughes should make such a statement. He could only suppose that that gentleman made it because he was in a place where no one could reply to it.

Mr. HUGHES: But the report of it is in your own journal.

Mr. SHEDLOCK: Mr. Hughes does not deny the truth of the report.

Mr. HUGHES: No; it is all correct—every word of it.

Mr. SHEDLOCK proceeded to say, that the board ought to elect a person who would not make such claims. Mr. Hughes's bill was never examined by any member of the committee or vouched by them; and, with reference to the statement that the greater portion of the £233 was for money paid out of pocket, he would ask what was the meaning of such items as these—"Twenty-eight days at five guineas a day," and, again, "Six days at five guineas a day?" Here was £178 out of the £233 at once for personal services. How, therefore, Mr. Hughes could state that the greater portion of his claim was for money paid out of pocket he could not conceive. Another item in the account was for "First-class assistant," a certain number of days, at 30s. a day. Was Mr. Hughes money out of pocket by that? Then, there was "Second-class assistant" at 15s. a day, and that was how the amount was made up. He believed the feeling of those who voted the money was that it was an unpleasant affair, and it was no use getting into litigation about it. He could appeal to many members of the board who said it was an unfortunate thing, but they did not want to get into litigation, and they felt ashamed of it. He thought he had now given sufficient reasons why they should, at all events, desire to have some one at the Metropolitan Board of Works, who would be free from this reproach, and who was not likely for personal gain or aggrandizement to adopt any views contrary to the feelings of his constituents. What confidence could they have in sending Mr. Hughes, after what they had heard? How could the members of that board join with him in confidence and good will with this stigma upon him? They could not; there would be a taint such as he hoped the member for this district would ever be free from. He (Mr. Shedlock) thought the payment of those charges to Mr. Hughes was an illegal one; and he opposed it before the auditor. He had the misfortune not to express himself clearly enough on that occasion, and also to be opposed by his friend, Mr. Rogers; but, in spite of all that, what did the auditor say? He said that the sections of the Act appeared to include professional services, inasmuch as they included work done for the vestry; but the operation of those sections appeared to him to be this: that from the moment Mr. Hughes was employed professionally—*i.e.*, from May, 1859—he should have ceased to be a vestryman, as every time he acted in that capacity, he incurred a penalty of £50. He also stated that there was nothing in the sections to render the payment to Mr. Hughes for his services an illegal payment; but he added, "I have, therefore, most reluctantly, I must confess, arrived at the conclusion that, however much against the spirit of the law, it is not unlawful according to the letter, and that I have no power to disallow it." What stronger censure could there be than was conveyed by those words? Would the board send as their representative to the Metropolitan Board a gentleman against whom this was publicly recorded in the vestry minutes? He had hoped that this unpleasantness would have been avoided by the retirement of Mr. Hughes. He thought that gentleman had done enough in having received the money, because immediately he received it, he gave up his connexion with the vestry.

Mr. HUGHES: It was before.

Mr. SHEDLOCK: I say he did not send in his resignation until he had received the money from the vestry.

Mr. HUGHES: And I say, I believe I did resign fully before I received it.

Mr. SHEDLOCK said he was prepared to prove that after the time the auditor put the construction on the Act of Parliament, Mr. Hughes attended the vestry seven times; and he could show that not until after he had received the cheque did he resign. There was another matter in connexion with this which showed that the parties were not badly paid. One of the gentlemen, who had received £117, thought himself so well paid that he must send a compliment to the vestry-clerk. The vestry-clerk very properly refused to receive it, and sent it back again. Their friend, Mr. Hughes, was a little more delicate. He sent a cheque to the vestry-clerk for an institution with which he was connected, for ten guineas; and, in the same communication, he suggested certain questions to be put to other companies, where there was likely to be an appeal against the rates. He (Mr. Shedlock) thought he had given sufficient reason why he must mistrust Mr. Hughes. He certainly thought it would have been in much better taste, after what had occurred, if Mr. Hughes had retired, as it would have prevented the unpleasant necessity of stating these things. He was convinced that the feeling was so strong, that it would be better for him to retire now. He certainly would support Mr. Miller, as being better adapted to represent the district at the Metropolitan Board.

Mr. ILES said he thought that only those who had a vindictive feeling against Mr. Hughes could say anything to his prejudice. How could Mr. Miller represent them better than Mr. Hughes? Some persons said it was because of political differences of opinion. (Laughter.) Then it was said that Mr. Hughes was not appointed by the vestry; but that was not true. The vestry appointed a committee; but some of the members of that committee never attended, but left all the work to be done by Mr. Hughes and Mr. Clarke. (Laughter.) He maintained that no one had ever attended to parish business so well as Mr. Hughes. He cared nothing about Mr. Hughes, nor any other man; but he did not wish the board to vote against that gentleman from vindictiveness. (Interruption.)

The CHAIRMAN said he must call upon the honourable member to retract that expression. (Continued interruption.)

Mr. ILES said he would be heard. Mr. Hughes was a man of mechanical knowledge, and could express himself in a mechanical way; but Mr. Miller had no practical knowledge of what the board wanted to understand. As to the payment made to Mr. Hughes, if the auditor could not disallow it, he was entitled to receive it. He believed the men who were most against Mr. Hughes were those members of the board who had attended the fewest number of times; and every one who voted against him on this occasion would vote according to a clique, and not according to a principle.

Mr. BIGG denied that he was influenced by malignant motives, as suggested. He was only influenced by a sense of duty.

The CHAIRMAN said, he must put a stop to the discussion, and take the vote. (Interruption.)

Mr. GODSON, in supporting Mr. Hughes, said, that gentleman had rendered services to the parish as a ratepayer, and had given evidence under subpœna, for which he was certainly entitled to be paid.

Mr. HUGHES said, before the question was put, he must ask to be permitted to make a remark or two upon what had fallen from Mr. Shedlock. He had distinctly charged him with making three misstatements before the Metropolitan Board of Works. This he (Mr. Hughes) denied. The ground upon which it was said he had made misrepresentations was, that he said he had acted upon a resolution of the vestry. The fact was, that on a previous occasion of a similar kind there was a resolution to that effect, and he then refused to receive any remuneration. He was asked to accept it, and to continue his services to the parish in important rating matters. If Mr. Shedlock had examined the minutes of the vestry, he would have found that resolution. It was absurd to suppose that he was not only so dishonest, but so injudicious as to make a statement at the Metropolitan Board which was not true. The gentleman who was now reporting these proceedings was present at the time he made the statement—reporting for that journal which had followed and dogged him about the metropolis for three years past, which reported everything that it was thought would tell against him before the gas companies, because he had gone boldly into the fight, and had opposed them as the great oppressors of the gas consumers of the metropolis. It was because of that, that he was brought into this state of collision. He had worked for the public most heartily ever since the passing of the Metropolis Management Act; and he rejoiced that those who came here to-day to propose an opponent were those of whom he knew the least at that board. They had, he believed, been members from the commencement, but they certainly had given the fewest attendances, and this was to him a consolation in the prospect of the defeat he would probably sustain. With reference to another observation which had been made, he asserted that the present increase in the rating of the Chartered Gas Company was entirely due to the action taken by the parish upon the arbitrator's award. To put it on the ground of the districting arrangements, and to suppose the company would be such idiots as to allow their assessment to be increased £2000, because their rental was now a little larger, was absurd. Why, their whole receipts in the parish did not affect the assessment more than £300 or £400. It was because of the immense works they had in the parish that their assessment was so high, and was not due to the receipts there, except to a most infinitesimal amount. The whole increase to £9000 arose out of the arbitrator's award at that time, and, therefore, the statement he made at the Metropolitan Board was perfectly true. With regard to the other statements of Mr. Shedlock, he gave them a most unqualified denial, and said of the whole that they were misstatements got up for the purpose.

Mr. SHEDLOCK wished to offer a word in explanation. The resolution which Mr. Hughes had quoted referred to the assessment of Messrs. Broadwood's premises, and had no reference to the Chartered Gas Company's appeal, which was not then in existence. He asserted, in the most distinct terms, that there was nothing at all in the resolution which referred to a retainer of Mr. Hughes professionally against the Chartered Gas Company. He knew nothing of Mr. Hughes, except in his public capacity; and, therefore, when charged with making malignant statements against him, the charge was wrong.

On the names being put to the vote, there appeared—for Mr. Hughes, 11; for Mr. Miller, 29.

Mr. GODSON demanded a division, upon which there appeared—

For Mr. Miller	30
Mr. Hughes	13
Majority	17

Mr. SCUDAMORE then proposed a vote of thanks to Mr. Hughes for his services as representative of the district at the Metropolitan Board during the last three years.

Mr. BIGG seconded, and Mr. SHEDLOCK supported the motion, which was put and carried unanimously.

Mr. HUGHES said he had to thank the board for the resolution just adopted, and to assure them that he retired from the contest with no ill-will to any one. He rejoiced that their choice had fallen upon a gentleman so well qualified to be their representative as Mr. Miller. For himself, he should find it a relief to be free from the duties which the office imposed upon him, that he might devote himself to other matters which required his attention. He had, however, thought it would not be right to retire until he had had the opportunity of replying to the statements which had been made against him.

DR. J. NORTHCOTE VINEN'S REPORT ON THE GAS SUPPLIED BY THE SURREY CONSUMERS COMPANY:—

1862. Week ending.	Number of Observations.	Maximum Light. Candles.	Minimum Light. Candles.	Average Light. Candles.
June 7	4	15·27	14·20	14·72
,, 14	4	15·19	14·15	14·71

There were 4 per cent. in volume of hydrocarbons; carbonic acid, 1 per cent. No sulphuretted hydrogen could be detected, or ammonia, except on the 7th, when there was a slight trace.

GAS STEALING AT KNOTTINGLEY.—On Saturday, May 31, as Mrs. Jackson, of the Temperance Hotel, at Knottingley, was in the cellar of her house, and was engaged in doing something near the gas-pipe, an escape of gas occurred, and, it having become ignited, burned Mrs. Jackson's face. The gasfitter was immediately sent for, but he could not discover the defective part of the pipe in order to extinguish the flame. The case was at once made known to the manager, who, having turned off the main-tap, proceeded to the spot, and discovered that there had been a private pipe put into the main before it reached the meter, and then attached to the service-pipe, in order to procure gas independently of the meter. It was neatly plastered over, so that discovery was difficult. A special meeting of the directors was held, and instructions were given for legal proceedings being commenced, and the full penalty, £20, enforced. Mrs. Jackson had, however, heard of this, and at once sent £20, in order to stay the proceedings.

THE AMERICAN PETROLEUM OILS.—At a meeting of the Court of Aldermen of the City of London, held on the 3rd instant at Guildhall—Alderman Finnis presiding—their attention was called by Mr. Woodthorpe, the town-clerk, to an official communication addressed to him by the Commissioners of Sewers relative to the storing of American petroleum in premises No. 8, St. Mary Axe. It enclosed an extract from a recent report of Dr. Letheby, the medical officer of health, stating that, complaints having been made to him on the subject, he had visited the house, and found the ground-floor used in storing petroleum. Some of the American oils, he added, were exceedingly ignitious, and would take fire, on exposure to a flame, at a considerable distance from the vessels containing them; and, seeing how carelessly the oils were treated, not merely in the storage of them in places where they were likely to take fire, but also in their commercial management, he was of opinion that some regulations should be agreed upon in respect to them. These, he stated, were necessary as well for the public health as for the public safety. Already regulations were in operation as to the storage of other inflammable commodities, such as gunpowder, phosphorus-matches, and methylated spirit. The Commissioners of Sewers stated that they had deemed it their duty to bring the subject under the consideration of the magistrates of the City, with whom, they were advised, the power lay to issue such orders, and take such measures as they might think fit for the public safety with respect to the dangerous material in question. Alderman Copeland, M.P., observing upon the grave importance of the circumstances disclosed by the commissioners, moved that the communication be referred for consideration to the General Purposes Committee; and that, on the summons convening them, the subject be distinctly indicated, in order to secure as full a meeting as possible. Alderman Lawrence submitted that, having regard to the highly combustible nature of this material, and to its storage in a populous part of the City, the court should at once proceed to frame regulations with respect to it, seeing that before the committee could meet, or while they were deliberating on the subject, an accident might possibly occur. Alderman Wilson questioned whether the magistrates had any power to regulate the storage of this partimaterial, though they might do so in the case of gunpowder. Eventually, on the suggestion of Alderman Challis, the motion was modified, to the effect that the committee forthwith take such steps in the matter as might appear advisable in the opinion of the law-officers of the corporation, and in that shape it passed.

WIDE ESTIMATING.—The following are the tenders received for the erection of gas-works for lighting the village of Kibworth, in Leicestershire, the plans and specification for which were prepared by Mr. George Gile, of Kettering:—

	Apparatus and Mains.	Buildings.
Wilson and Co.	£837 11 6	
Barlow and Butler	560 0 0	
Mason and Loveday (accepted)	463 0 0	
George Bower	£1322 10 0	575 10 0
C. Walker and Sons	1157 0 0	
Stenson	1062 7 6	
Bromley	1045 0 0	
Cliffe	930 0 0	
Law and Sons (accepted)	860 0 0	

Price Current.

CASTINGS.—*Per Ton.*

Average Weight of Cast-iron Gas-pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lb.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow.	Newcastle	Wales.	Yorkshire, Derbyshire, and Staffordshire.
	£. s. d.	£. s. d.	£. s. d.	£. s. d.	£. s. d.
Pig Iron, No. 1, G.M.B.	3 5 0	2 13 6	2 15 0	3 0 0	3 5 0
1¼ and 2-inch Socket-pipes	7 0 0	6 0 0	6 5 0	6 10 0	6 15 0
2½ and 3-inch ditto	6 10 0	5 10 0	5 15 0	6 0 0	6 5 0
5 and 5-inch ditto	6 0 0	5 0 0	5 5 0	5 10 0	5 15 0
6 inches and upwards ditto	5 15 0	4 15 0	5 0 0	5 0 0	5 10 0
Retorts, 1st fusion, hot blast	5 10 0	4 10 0	4 15 0	5 0 0	5 5 0
Ditto, 2nd ditto, cold ditto	6 10 0	5 5 0	5 10 0	6 0 0	6 5 0
Tank-plates, ¼ thick and above	6 0 0	5 0 0	5 5 0	5 10 0	5 10 0

WROUGHT-IRON TUBING,

Subject to 40 per cent. Discount.

	2 in.	1¼ in.	1½ in.	1 in.	¾ in.	½ in.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent Welded Tubes, from 2 to 12 feet—per foot	1 8	1 0	0 10	0 7	0 5	0 4¼
Ditto ditto, from 6 inches to 12 inches—each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting-pieces, or Long Screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, Springs, and Elbows (wrought iron)	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, ditto	4 6	3 0	2 6	2 0	1 6	1 2
Iron Cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing Sockets, Caps, Plugs, and Nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain Sockets	1 0	0 8	0 7	0 5	0 4	0 3
Syphons, 2-quart	15 0	14 0	13 6	13 0	12 0	—

COALS.—*Per Ton.*

Newcastle.—Unscreened.	6s. 9d.
Whitwell Primrose	
Medomsley, Eighton Moor, and Burnhope	7 0
Pelaw	7 3
New Pelton, Pearth, South Pelaw, Washington Hutton, and South Pearth	7 6
Pelton	7 9
Ramsay's Newcastle Cannel	16 0

Scotch Cannel.	45s. 0d.
Boghead (at Leith)	
Kirkness, best	23 0
Capeldrae, 1st quality	20 0
Ditto, 2nd ditto	13 6
Lesmahago (at Glasgow)	25 0
Ditto (at Leith)	27 6
Arniston	27 6
Wemyss	20 0
Knightswood	18 0
Pirnie	14 0

FREIGHTS.

Coastwise—Newcastle.—Per Ton.	5s. 6d.
Chatham and Rochester	
Cork	8 3
Dover and Folkestone	5s. 9d. to 6 0
Dublin	8 9
Exeter Quay	7 9
Ipswich	5s. 3d. to 5 6
London (Pool)	5s. 6d. to 5 9
Lowestoft and Yarmouth	4s. 6d. to 4 9
Lynn	5 6
Portsmouth and Southampton	6s. 6d. to 6 9
Plymouth	7s. 3d. to 7 6
Shoreham	6 9
Whitstable	6 0
Weymouth	—

Foreign.—Per Keel.	£25 0s.
Barcelona	
Bordeaux	£15. 15s. to 16 0
Boulogne and Calais	7 5
Cadiz	16 0
Cronstadt	11 17 6
Copenhagen	9 15
Genoa	£23. 10s. to 24 10
Hamburg	£7. 15s. to 8 0
Havre de Grace	9 0
Leghorn	23 10
Lisbon	16 0
Rotterdam	7 10
Stettin	11 0
Trieste and Venice	£23. to 25 0

SUNDRIES.

Best Newcastle Fire-bricks—per 1000	£2	15s.	0d.
Cliff's Fire-bricks (at Wortley)—per 1000	2	15	6
Ingham's ditto (at Wortley)—per 1000	2	15	0
Fire-clay Retorts—per foot run	0	7	0
Tough Cake Copper—per ton	93	0	0
English Pig Lead—per ton	21	0	0
Welsh Bar Iron (in London)—per ton	6	0	0
Foreign Spelter—per ton	17	10	0
English Block Tin—per ton	114	0	0
Banca—per ton	123	0	0
Tarred Rope Yarn—per cwt.	1	6	0

Advertisements.

PATENT Silica Bricks, adapted for Intense Heats of Copper, Iron, Glass, and Chemical Works.

PATENT SILICA RETORTS, as supplied to the Manchester Corporation Gas-Works.

Apply for Prices to H. J. WALDUCK and Co., Queen's Chambers, Market Street, MANCHESTER.

WILLIAM RICHARDSON & CO., TUNNEL FOUNDRY, DUDLEY,

Manufacturers of Gasholders, and all descriptions of Gas Apparatus, beg to call the attention of Gas and Water Companies to their Double-Faced SLIDE-VALVES, which for Economy and Durability cannot be surpassed, and respectfully solicit a trial. Full particulars on application.

JAMES FERGUSON and CO., Lessees of the Auchinheath and Craignethan Gas Coalfields (the most extensive and valuable in the parish of Lesmahago), respectfully intimate to the Managers of Gas-Works and Consumers of Gas-Coal, that they are prepared to ship the best quality of the above well-known COALS at Glasgow or Leith; and also to deliver them at the railway stations upon, or connected with, the Caledonian Railway, to any extent which may be required.

Price, free on board, or delivered at the railway stations, may be learned by addressing James Ferguson and Co., Gas-Coal Works, Lesmahago.

Shipping Agent for Glasgow:
MR. ALEXANDER STRATTON,
109, WEST GEORGE STREET.

TO GAS COMPANIES.

FOR SALE, a Telescopic Gasholder, about 53½ ft. diameter by 24 ft. in depth, having a working capacity of about 50,000 cubic feet.

Also, two Single-lift GASHOLDERS, each about 33 ft. diameter by 18 ft. in depth, and each having a working capacity of about 15,000 cubic feet.

These Gasholders have guiding and counter-balancing apparatus complete, are now at work, and in excellent condition.

Apply to W. ESSON, Engineer, Gas-Works, CHELTENHAM.

TO GAS COMPANIES.

ON SALE, by Private Treaty, at the Gas-Works, St. Helen's, Lancashire, a STATION-METER, capable of passing 7000 cubic feet per hour, with Bye-Pass, Clock, and Tell-tale.

Reference can be made to Messrs. WEST and GREGSON, Meter Manufacturers, OLDHAM.

Apply to Mr. WILLIAM PRITCHARD, Gas Office, ST. HELEN'S.

FOR SALE.—Two Second-Hand Cast- IRON DRY-LIME PURIFIERS, with Wrought-Iron Covers, 5 ft. by 3 ft. in the clear, in good condition. There are two complete sets of Lime Girds of punched plate nearly new.

Apply to ED. COCKEY and SONS, who are manufacturers of Gasholders, Purifiers, Scrubbers, Condensers, and all kinds of Gas Apparatus, and have a variety of patterns suited for Gas-Works of different sizes.

Iron-Works, Frome Selwood.

TO GAS ENGINEERS AND OTHERS.

THE Advertiser, age 32, who has had upwards of 11 years experience in the general management of Gas-Works, will give £50 to the person who will provide for him a permanent situation in this country as MANAGER of a Gas-Work, at a salary of about £130 per annum. First-class testimonials and references as to character and ability can be given.

Address, CONFIDENCE, care of Mr. King, 11, Bo lt Court, Fleet Street, LONDON, E.C.

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WANTED, by the Advertiser, a Situation as MANAGER of a Gas-Work. Salary to be dependant entirely upon the profits. Cash security for due performance. Testimonials and references as to character and ability unexceptionable.

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THE Advertiser, aged 29, is desirous of an appointment as Manager of a small Gas-Work, or as Foreman of Fitters in a large Work. Understands the manufacture and distribution of Gas, and has a thorough practical knowledge of main-laying, meters, and gas-fitting. Can speak Spanish fluently, and would have no objection to go abroad.

Address, F. G., care of Mr. Groom, Chemist, 31, Northumberland Street, T. P., LIVERPOOL.

GEORGE GLOVER and CO.'s

PATENT DRY GAS-METERS,

THE STANDARD GASHOLDERS, AND TESTING APPARATUS.

The Act of Parliament, 22nd and 23rd Vict., cap. 66, for "Regulating Measures used in Sales of Gas," having come into operation, and limited the range of error in Gas Measurement to 2 per cent. as against the Customer, and 3 per cent. as against the Manufacturer, a far higher degree of accuracy in Meters than that generally attained hitherto is indispensable.

This necessity Messrs. GEORGE GLOVER and Co. are fully prepared to meet—their PATENT DRY GAS-METER being made in accordance with the same high standard of accuracy, and the same conditions and principles as those adopted in the construction of the National Standard Gasholders at the Exchequer, and the Derived Standards for London, Edinburgh, and Dublin, all of which were constructed from Mr. GEORGE GLOVER'S designs, and under his superintendence.

It is obviously the interest of Gas Companies to exert their legitimate influence to procure, without delay, the most accurate and durable Meters, since, by Sec. 16 of the Act, it is provided that "Every consumer of Gas may purchase and use for the measurement of the Gas supplied to him *any Meter* duly stamped under the authority of the Act."

Messrs. GEORGE GLOVER and Co. are ready to negotiate with Corporate Bodies, or with Gas Companies, for the supply of Meters on the principle of hire—10 per cent. being allowed for the collection of Meter-rent.

Messrs. GEORGE GLOVER and Co. keep in stock Meters from One Light to Two Hundred Lights, and make them to order of any size, at prices lower than Wet Meters, and as moderate as any in the market. They maintain them for Five Years in good working order, within the requirements of the Act, free of cost to the Purchaser; and, for a longer period, at a much lower cost than that at which Wet Meters can be maintained.

Particulars and Lists of Prices will be forwarded on application.

Messrs. GEORGE GLOVER and Co. are prepared to supply to Gas Companies, Gas Engineers, Meter Manufacturers, Local Authorities in Great Britain and Ireland, Colonial Authorities, and Foreign Governments, GASHOLDERS of the highest attainable accuracy, with proper Balances, Indices, and Apparatus, as the Sales of Gas Act requires, and exact copies of the National and Derived Standards.

The daily use of these instruments for nearly Eighteen Months has shown them to be thoroughly adapted to the purpose of their manufacture, and fully justified the opinion expressed of them by the Astronomer-Royal, in his report to the Lords Commissioners of Her Majesty's Treasury, as capable of "being applied to Gas-Measures of every class, and Gas-Meters of every class;" "as accurate as it is possible for human skill to make them;" "to all intents and purposes perfect."

Messrs. GEORGE GLOVER and Co. fit up TESTING-ROOMS with Gasholders and Apparatus, the same as those at the Exchequer, and adapted to the requirements of districts of any extent, either in the United Kingdom or abroad.

Estimates furnished when required.

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Gas Engineers and Contractors for Gas and Water-Works; manufacturers of Steam Engines and Exhausters, Steam Boilers, Gasholders, Cast-Iron Tanks, Purifiers, Condensers, Iron Retorts, Gas and Water Pipes.

Plans, Specifications, and Estimate furnished for new, or for extensions and alterations on existing, Works.

ESTABLISHED 17 YEARS.

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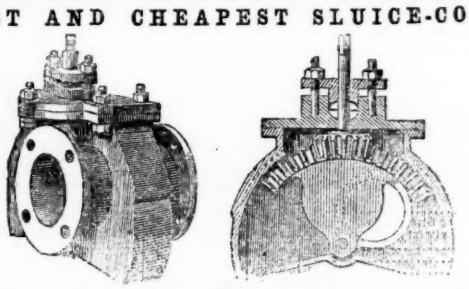
GRATIS, and post free, "THE INVENTOR'S MANUAL;" also a pamphlet, "*L'Obtention de Patentes Anglaises;*" 500 MECHANICAL MOVEMENTS; the first part of Kinematics, or the Transformation of Motion. By JOSEPH WILLCOCK, C.E., Mem. Soc. of Eng. May be had at the above address, and of any Bookseller. Price 2s. 6d. The second part is approaching completion, and will shortly be announced.

BEST AND CHEAPEST SLUICE-COCK.



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Above 3-inch diameter, price 10s. per inch. Brass face, 6d. eri nch extra.

Can be taken to pieces without being removed rom the line of Piping.

NORTH WILTS FOUNDRY, DEVIZES.

Wholesale Agents, Messrs. S. and E. RANSOME, 31, Essex Street, Strand, E.C., Where a Sample may be seen.

COCKEY'S PATENT GAS-VALVES.

These Valves are formed of two Cast-Iron Cylinders, with segmental divisions, having the faces ground gas-tight—the upper Cylinder turning horizontally on the lower one.

The lower Cylinder has pipes from each division, communicating with the vessels to and from which the gas is to be passed. The upper Cylinder has corresponding divisions, so arranged as to direct the passage of gas to the different segmental divisions in the lower part, and, when it is turned on the face of the lower one, to alter the flow of gas from one vessel to another.

These Valves are adapted either for bye-passes; for connecting two, three, and four purifiers; or for the inlets of several Gasholders, and are in use for these purposes at the following Works:—

ALTON, HANTS.	CLEVEDON.	ENNISCORTHY.	NEWPORT, MONMOUTH.
BRIGHTON.	CHELTENHAM.	FROME.	REDRUTH.
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CANTERBURY.	ELGIN.	MALVERN.	

Besides many small private Gas-Works.

There are Two specimens at the International Exhibition in Class 10; one of them represents the Valve with its Index-Plate fixed for regulation, and the other shows the Valve open, exposing its passages.

IRON WORKS, FROME SELWOOD.

STOURBRIDGE FIRE-CLAY WORKS.

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(Contractors to Government).

24 WHARF, HARROW ROAD, PADDINGTON, W.

Every article manufactured at their own Works and Mines, Brierley Hill.

FIRE-BRICKS, Lumps, Squares, Tiles, and Gas Retorts of all dimensions.

CRUCIBLE and CEMENT CLAYS.

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CLINKERS and STABLE PAVINGS, noted for hardness and durability, being perfectly non-absorbent.

Shipments on the shortest notice.

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CONSULTING ENGINEER,
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MANUFACTURERS OF
FIRE-CLAY GAS-RETORTS,
OF ALL DIMENSIONS.
LUMPS, TILES, BRICKS, &c.

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The Work consists of upwards of 400 pages, and there are 20 large plates.

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A. and C. MILLER, Agents for English and Welsh Gas, Steam, and House Coal Collieries. Ship, and Insurance Brokers. Gas Coals, 11s. 6d. in the Pool; drawback, 1s. per ton.

No. 9, George Yard, Lombard Street, and Coal Exchange, LONDON, E.C.

METROPOLITAN BOARD OF WORKS.
MAIN DRAINAGE OF METROPOLIS,
SOUTHERN OUTFALL WORKS, CROSSNESS.

TO Builders, Contractors, and Others.—The Metropolitan Board of Works hereby give notice, that they will MEET at the Office of the Board, Spring Gardens, on Friday, the 4th day of July next, at Twelve o'clock at noon precisely, and will then be prepared to open TENDERS by parties who may be willing to CONTRACT for the CONSTRUCTION of ENGINE-HOUSES, a Boiler-House, Chimney, Filth-Hoist, Coal-Sheds, Dwelling-Houses, Wharf-Wall, Sewers, and other works in connexion therewith, at Crossness, in the parish of Erith, in the county of Kent.

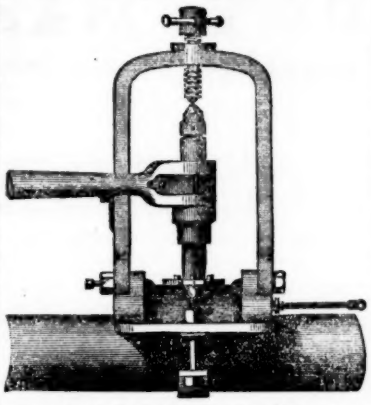
Parties desiring to submit Tenders may, upon payment of £21, obtain Plans, Sections, Specification, form of Tender, and other particulars, on application to Mr. J. W. BAZALGETTE, Engineer of the Board, at the Office, Spring Gardens, between the hours of Nine a.m. and Four p.m.; or on Saturdays, between the hours of Nine a.m. and Two p.m., until Thursday, the 3rd of July next. Half the amount will be refunded to such of the unsuccessful parties who return the Drawings within one week after the day appointed for opening the Tenders.

The Tenders are to be addressed to the Clerk of the Board, and must be delivered at this Office before Four o'clock on Thursday, the 3rd day of July next, and no Tender will be received after that hour. The parties tendering must be in attendance at the Board at Twelve o'clock on the day appointed for opening Tenders.

The Board do not bind themselves to accept the lowest or any Tender, and the party whose Tender shall be accepted will be required to provide two approved sureties for the due and satisfactory performance of the works.

JOHN POLLARD, Clerk of the Board.
Spring Gardens, S.W., May 8, 1862.

SIMMONS'S
PATENT GAS AND WATER CONNECTOR.



This Machine is invaluable to Gas and Water Companies, Gas-Fitters, &c., being the only Connector whereby accidents can be prevented. It is simple in construction, economical in saving the escape of Gas, and can be worked by a labourer.

No. 1 size, to suit ¾ and 1 in. Services, £6. 6s. each.
„ 2 „ „ 1¼ and 1½ „ „ £8. 8s. „
„ 3 „ „ 1¾, 1¾, & 2 in. „ £12. 12s. „
Including Rachet Brace, Drills, Taps, &c., complete.

MANUFACTURER,
J. COWDY,
OND COURT, WALBROOK,
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Connectors made for fixing on the ends of Mains, to prevent escape in course of laying.

DUPLEX GOVERNOR, for Gas-EXHAUSTER ENGINES.
D. LANE'S PATENT.

This Governor combines great delicacy with remarkable certainty of action. A pressure of one-tenth of an inch of water, operating on a diaphragm of 3 inches diameter, is sufficient to work the Regulating-Valve of an Engine of any power.

TESTIMONIALS.

Borough Engineer's Office, Town Hall
Halifax, March 29, 1862.

Dear Sir,—I have much pleasure in bearing my testimony to the efficiency of your Duplex Governor for regulating the speed of Gas-Exhausters.

The Governor has been perfectly self-acting, and has never given us one moment's thought, trouble, or expense. The engine-man has only to weight the tappets to the required vacuum, and the pressure-register paper never shows a greater variation than three-tenths in the twenty-four hours.

I can very confidently recommend the adoption of it to engineers and managers of gas-works making 50 million feet a year and upwards.

I am, dear Sir, yours faithfully,
G. W. STEVENSON.

Denny Lane, Esq., Cork Gas-Works,
Ireland.

Gas-Works, Cork, April 4, 1862.

Dear Sir,—Having for some time past had in use three of your newly-invented Regulators for governing the speed of Steam-Engines in connexion with Gas-Exhausters, I am glad that I am able to speak of this valuable machine in terms of the highest praise. I have had them applied, as you know, to high-pressure and condensing engines, with Beale's and also Anderson's Exhausters. In every case, this small and valuable instrument is thoroughly effective in regulating the speed of the Exhauster. No amount of care with the hand can equal its accuracy of action for the intended purpose.

Denny Lane, Esq. A. H. STILL, C.E.

An Illustrated Circular, explaining the operation of the Governor, can be obtained by application to D. LANE, 72, South Mall, CORK; and the Governor can be seen in London at the Offices of GEO. ANDERSON, Esq., C.E., 16, Adam Street, ADELPHI.

GEORGE CUTLER & CO.,
GAS ENGINEERS, &c.,
London Gasholder and Boiler Works,
8, WHARF, WENLOCK ROAD, CITY ROAD, N.,
LONDON.

Rye, Nov. 12, 1860.

Dear Sirs,—I consider it incumbent on me to acquaint you that the alterations recently made on the Rye Gas-Works—viz., the addition of a NEWLY-IMPROVED WASHER, and other work for the Purification of Gas, executed by the experienced workmen under your able supervision—are perfectly satisfactory to the Company, and the Gas is now as pure as it can be made.

I am, dear Sirs, your obedient servant,
CHARLES THOMAS, Superintendent,
Rye Gas-Works.

Messrs. Cutler and Co.

WHITEHOUSE and CO., Boiler and GASHOLDER MAKERS,
GLOBE PATENT TUBE WORKS,
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Beg to draw the attention of Engineers and Managers of Gas Works to the superior quality of the Article they manufacture, both in respect of the iron employed, and the perfect manner in which it is welded; in proof of which they can refer to the testimonials of the most eminent Gas Engineers, and the experience of the principal of the large Gas Companies of the kingdom.

Orders promptly executed.

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NEWCASTLE-ON-TYNE & MIDDLESBRO'-ON-TEES.

Wrought and Cast Iron Pipes, Cast-Iron Retorts, and all kinds of Foundry Work necessary for Gas-Works. Fire-Bricks and Clay Retorts. Gas Coals of every description. Pig, Bar, and Plate Iron.

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12, ROYAL EXCHANGE BUILDINGS.

BENJAMIN GIBBONS, Jun.,
DEEPDALE FIRE-CLAY & BRICK WORKS,
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Manufacturer of every description of Fire-Bricks, Lumps, Quarries, Shields, Flue Covers, &c., to any size or shape required.

FIRE-CLAY RETORTS,
TO MODEL OR DRAWING.

B. G. begs to call the attention of Gas Companies to his Fire-Clay Retorts, which have been used with great satisfaction in some of the largest Gas-Works in the Metropolis and many Provincial Towns in England.

References given, if required.

WALTER MABON, Engineer,
ARDWICK IRON WORKS, FAIRFIELD STREET,
MANCHESTER,
Manufacturer of
IRON TANKS for Gasholders, Railway Stations, &c.

GASHOLDERS.—Extensive premises at Gorton, solely for the manufacture of Gasholders, and other heavy Wrought-Iron Structures.

GAS APPARATUS.—W. M. has an extensive assortment of patterns for Purifiers from 4 feet to 15 feet square, also round ones from 4 feet to 10 feet diameter; Scrubbers, Condensers, Washers, Columns, Girders, and Tripod Patterns, suitable for Gasholders, from 10 feet to 150 feet diameter, either Single-lift or Telescope. Contracts for Gas-Works of any Magnitude. Designs, Specifications, and Estimates furnished.

WROUGHT and CAST IRON ROOFS for Railway Stations, Gas Works, Warehouses, and Sheds, prepared for Slates or for Corrugated Iron.

IRON HOUSES, either for Dwellings, Manufactories, or Public Buildings.

PIPES and VALVES, for Gas and Water, from 3 inches to 48 inches bore.

ANDERSON'S EXPERIMENTING LABORATORY
AND
GAS ENGINEERING OFFICES,
16, ADAM STREET, ADELPHI, W.C.
(Close to the Society of Arts.)

Mr. ANDERSON continues to Erect, or to supply the Drawings for his PATENT RETORT-SETTINGS. On this principle, three Ovens of Retorts are heated by one Coke and one Tar fire; and, for small Works, the principle is adapted to single Ovens in both cases, with a total absence of smoke, while the duration of the Retorts is from two to three years, and with great economy of fuel.

Mr. ANDERSON continues to supply his PATENT GAS-EXHAUSTER, together with Steam-Engines, &c., erected complete.

This is the most simple machine of the kind in use, being merely a double-action Pump, which any one can comprehend, and works for years without any repair.

Also, his PATENT FOUR-WAY VALVES. One of these valves does the work of three ordinary valves, when applied to Purifiers, Station-Meters, or other Gas Apparatus.

A workman cannot, by any possibility, make the mistake of shutting one passage without opening another; thus ensuring a constant flow of the gas.

All Racks, Pinions, Springs, and other delicate parts of ordinary valves, are in these valves abolished; the Connecting-pipes are also much simplified, and the cost reduced fully 30 per cent.

Also, his CONCENTRIC GOVERNOR, which stands in half the space of the ordinary Governor, and regulates the flow of Gas to the greatest nicety.

Mr. ANDERSON having five Gas-works on lease, besides being engineer to several others, has constant opportunities of perfecting his inventions before they are brought under public notice.

Mr. ANDERSON, in conjunction with Mr. STEVENS, of the Darlington Works, has recently erected and leased for a term of years, two Gas-Works of the Government, one at VICTORIA HOSPITAL, the other at the CAMP at ALDERSHOTT. At both places, the above designs are introduced, and cards to view may be had on application; as also, references to gentlemen who have used his apparatus for years.

Mr. ANDERSON may be consulted on all matters connected with the Manufacture of Gas, the Construction of new, or the reconstruction of old Works, Valuing the same, or obtaining parliamentary powers.

The Laboratory is being fitted up with apparatus for testing the chemical and photometrical properties of Coal-Gas, and also that of Meters, agreeably with the Act of Parliament. Gentlemen desirous of inquiring into such matters, are invited to pay a visit.

CLEGG ANNUITY FUND.

At a Meeting of the Subscribers held at the offices of the Brighton and Hove General Gas Company, 29, St. Swithin's Lane, London, on Monday, June 2, 1862—

JOHN GRAFTON, Esq., in the chair,

the following report was submitted by the trustees:—

"In laying before the Subscribers a statement of the result of their endeavours to raise a fund for the benefit of the widow and family of the late SAMUEL CLEGG, the Trustees cannot refrain from expressing their regret at the absence from the Subscription-List of the names of some of the largest and most prosperous of the Gas Companies of the United Kingdom, and of many manufacturers and traders in commodities which Mr. Clegg's genius has tended so greatly to develop. Having, however, thoroughly canvassed these bodies by circulars and advertisements, and believing that, with the exception of some Subscriptions which may possibly yet come to hand from the Colonies, but few additional Subscriptions are to be expected in this country, the Trustees have come to the conclusion that it is expedient forthwith to take the opinion of the Subscribers as to how the funds shall be employed.

"The total amount subscribed, including a small sum for interest allowed by the Bank on the balance in hand, amounts to £923. 5s. 10d. Out of this, the Trustees have, with the consent of Subscribers to more than the amount, advanced, for the purchase of the late Mr. Clegg's household furniture, £123. 14s. 7d., the property in which is now legally vested in them, but of which Mrs. Clegg is to have the use during her life. A further sum is needed to liquidate outstanding claims upon her; and, when these, and the expenses of printing, postages, and advertisements, are paid, there may remain about £700 to be appropriated as the Subscribers may direct, at a meeting called specially to determine upon its appropriation.

"The Trustees have anxiously considered how they should recommend this balance to be employed; and bearing in mind that, at Mrs. Clegg's advanced age, any annuity granted is scarcely an equivalent for the capital required for its purchase, they have resolved to recommend that the balance be invested in the names of the Trustees in some Five per Cent. Indian or Colonial Stock; and that sufficient of the capital be sold out from time to time, to make up, with the interest, the yearly sum of one hundred and thirty pounds, and that the same be paid to Mrs. Clegg at the rate of two pounds ten shillings per week, commencing on the 25th day of June, 1862. This will exhaust the capital in about six years and a half; and, should Mrs. Clegg survive its exhaustion, the Trustees apprehend the present Subscribers would not hesitate to respond to another appeal. Should, however, there remain any disposable surplus at Mrs. Clegg's death, the Trustees propose to hand it over to her daughter-in-law, the widow of the late Mr. Samuel Clegg, Jun., for the benefit of the two children of the latter, a daughter aged thirteen years, and a boy aged six years.

"The Trustees append a list of the subscriptions, and now request the instructions of the Subscribers as to the appropriation of the balance in hand.

"JOHN GRAFTON,
P. H. HOLLAND,
ROBERT JONES, } Trustees."

Whereupon it was moved, and seconded, and carried unanimously:—

"That the printed report of the Trustees, and the statement of accounts circulated among the Subscribers, and now laid before this meeting, be received and approved; and that the proposition contained in the report, for allowing a weekly sum to Mrs. Clegg, of not exceeding two pounds ten shillings per week, be carried out; the amount to be left to the discretion of the Trustees, who shall be empowered, if they see fit, to sink a portion of the fund in the purchase of an annuity."

"That the thanks of the Subscribers are eminently due, and are hereby given, to John Grafton, Esq., for the kind and zealous exertions he has made on behalf of the fund."

"That the thanks of this meeting be given to T. G. Barlow, Esq., for the very valuable assistance he has rendered to this cause."

JOHN GRAFTON, Chairman.

The following additional Subscriptions have been received since April 22:—

Thos. B. Campbell, Esq., Edinburgh	1	1	0
Messrs. Fullarton, Son, and Co., Edinburgh	1	1	0
A Lady	1	0	0
The Leicester Gas Company	10	10	0
The Runcorn Gas Company	2	2	0
Mr. Hewley	0	10	0
Miss Samuda, Holloway	3	0	0
Messrs. E. E. Goldsmid and Co. Paris	12	12	0
The Birmingham and Staffordshire Gas Co.	10	10	0
Messrs. C. and W. Walker, Clerkenwell	1	1	0
The Shipley Gas Company	1	1	0
The Cambridge Gas Company	5	5	0
G. Salmon, Esq., Cambridge	1	0	0
N. G. Da Costa, Esq.	1	1	0
J. J. Da Costa, Esq.	1	1	0
Charles Scott, Esq.	1	1	0
A. Finch, Esq.	1	1	0
G. Alfrey, Esq.	0	10	6
Mr. F. G. Giffard, Cambridge	1	1	0
G. Rait, Esq.	2	2	0
N. D. Goldsmid, Esq., the Hague	2	2	0
J. H. Grafton, Esq., Manchester	1	1	0

Erratum in List of April 8.

For Anglo-Romano Gas Company, *read*
James Shepherd, Esq., Rome 5 5 0

Subscriptions continue to be received by the Trustees at the London and County Bank, Lombard Street, London; and Mr. Thomas G. Barlow, of 42, Parliament Street, Westminster, has kindly consented to receive, on behalf of the Trustees, all letters and other communications that may be addressed to them.

THE

OTTOMAN GAS COMPANY, LIMITED.

Under a direct Concession from His Imperial Majesty the Sultan of Turkey.

(*To be Incorporated under the Joint-Stock Companies Acts*, 1856-57.)

CAPITAL, £100,000,

First Issue, £50,000, in 10,000 Shares of £5 each.

Ten Shillings per Share to be paid on Application, and Ten Shillings on Allotment; the remainder in Calls not exceeding One Pound, at intervals of not less than Three Months.

Five per Cent. Interest will be paid from the Date of Payment of the several Calls until the Company shall begin to supply Gas.

Directors.

SIMON ADAMS BECK, Esq. (CHAIRMAN), Governor of the Chartered Gas Company.
The Hon. ELIOT YORKE, M.P., Director of the National Provincial Bank of England.
EDWARD HORNER, Esq., Deputy-Chairman of the Phœnix Gas Company, London.
JOHN BETHELL, Esq., King William Street.
The Hon. HOWE BROWNE, Deputy-Governor of the Chartered Gas Company, London.
DONALD FRASER, Esq., M.D., 15, Harrington Square.
HENRY DEFFELL, Esq., Director of the Chartered Gas Company, London.

Auditors.

HENRY CHATTERIS, Esq., 5, Lothbury, Auditor of the Great Central Gas Consumers Company.
EDWARD PUGH ROWSELL, Esq., Secretary of the Malta and Mediterranean Gas Company.

Consulting Engineer.

GEORGE LOWE, Esq., C.E., F.R.S.

Engineer.

R. BAYLISS, Esq., C.E.

Solicitors.

Messrs. DAWES and SONS, 9, Angel Court, Throgmorton Street.

Bankers.

Messrs. BARNETT, HOARES, and CO., Lombard Street.

Brokers.

Messrs. CROSLEY BROTHERS, 30, Cornhill.

Secretary (pro tem.).

WILLIAM MACKENZIE, Esq.

Offices: 17, GRACECHURCH STREET, LONDON, E.C.

THE object of this Company is the Lighting with Gas the City of Smyrna, which contains a population, computed, by different authorities, to be between 150,000 and 175,000. Smyrna is the largest trading city in the Turkish Empire, and the principal commercial port in the Levant.

A Concession has been granted by his Imperial Majesty the Sultan, giving an *exclusive privilege* of lighting Smyrna for forty years; the maximum price to be charged for Gas under the concession being 13s. 8d. per 1000 cubic feet to consumers, and one-tenth less for the public lights. The concession contains clauses for the protection of the Company's interests, and is framed in all respects in a just and liberal spirit.

It is the intention of the Company to confine their earliest operations to that part of the City known as the European quarter, for which purpose it is calculated that £50,000 will be sufficient; this sum includes £3500 to be paid to the Concessionaire, and an equal amount in paid-up shares.

The price of Gas-Coal in Smyrna is 25s. to 30s. per ton, and there is a good market for Coke, Tar, and other products, at a much higher price than can be obtained for them in England. The increased price of Coal at Smyrna as compared with London will add at most 1s. 6d. to each 1000 cubic feet of Gas manufactured, while the price allowed to be charged for Gas under the concession is about three times that charged in London; and, even if the maximum price under the concession were charged, the mode of lighting by gas would be far cheaper than by Oil, as at present used.

English capital has rarely been invested with more satisfactory results than that embarked in Gas-Works in England and abroad, and it is found that, where estimates have been carefully made, the results of the working of these Companies render them unquestionably safe and most remunerative investments. Considering the position of Smyrna, with its increasing importance as a Commercial Port, and the liberal terms of the concession obtained by the Company from His Imperial Majesty the Sultan, the Directors feel justified in stating, as their opinion (based upon the estimates carefully made by the Engineers of the Company), that a dividend of from 12 to 15 per cent. per annum will be obtained.

Although the operations of the Company will, in the first instance, be confined to the City of Smyrna, it is contemplated, with the permission of His Imperial Majesty the Sultan, and the concurrence of the Shareholders, to undertake the lighting of other cities in the Ottoman Dominions.

In the event of no allotment being made, the deposit will be returned to the Subscriber, without any reduction whatever. It is to be observed that Shareholders may, if they see fit, pay in full the amount of their Shares, upon which they will receive £5 per cent. interest, as before mentioned.

To the Directors of the Ottoman Gas Company, Limited.

Gentlemen,—The estimates upon which the formation of this Company are based have been carefully considered by me in connexion with the requirements of the City to which it is intended to supply Gas. I am clearly of opinion that the amount of profit is not over estimated at 16 per cent., which would yield a divisible profit of from 12 to 15 per cent., after a proper provision for a reserved fund.

I am, Gentlemen, your obedient servant,
GEO. LOWE, C.E., F.R.S.

Finsbury Circus, May 17, 1862.

Prospectuses may be obtained at the Brokers of the Company, Messrs. CROSLEY BROTHERS, 30, CORNHILL, and at the Offices of the Company.

WILLIAM RICHARDS,

PATENT DRY AND WET GAS-METER MANUFACTURER,

CRAWFORD PASSAGE, COPPICE ROW, CLERKENWELL, LONDON.

William Richards, Sole Inventor, Co-patentee, and original Manufacturer of the Dry Meter, generally known as Croll's or Glover's, and which obtained Prize Medals at the Universal Exhibition, 1851, the New York Exhibition, 1853, and the Paris Exhibition, 1855, intimates to Gas Companies, Engineers, and the Trade generally, that he has established a Manufactory at the above address for his Dry Meters; and, in soliciting the patronage of those engaged in Gas Lighting, the Advertiser can assure them that the Instruments manufactured by him are not to be surpassed. They are capable of indicating accurately the smallest possible quantity. Their flexible material is of a superior quality, which Fifteen years experience has demonstrated to excel all others for durability; and all the metals of the working parts are incorrodible.

W. R. invites the attention of those preferring the Wet Meter to his patented improvements therein, which consist in contracting the Chambers of the Measuring-Wheel, at and near the Water-Line, thus allowing of a longer range for the Float, and avoiding the sudden extinctions so common; also a simple remedy is applied to prevent the fraudulent consumption of Gas, which the operation of the recent Sales of Gas Act has so much facilitated.

The workmanship and materials are such as to leave nothing to desire.

A TRIAL ORDER IS SOLICITED.

Manufacturer of the

TELL-TALE EXHAUST AND PRESSURE-INDICATOR;

An indispensable Instrument to the perfect working of the Exhauster.

GOVERNORS, STATION-METERS, DRY METERS FOR PUBLIC LAMPS, &c.

WILLIAM SUGG,

MANUFACTURER OF

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"EVANS'S" PHOTOMETERS,

Experimental Meters, Minute Clocks, &c., Station Meters and Governors,

STREET-LAMP GOVERNORS AND LAVA BURNERS,

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(PHILOSOPHICAL INSTRUMENTS.)

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(Opposite the AMERICAN DEPARTMENT.)

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Buccleuch Street Works, Edinburgh, & 13, Strutt Street, Manchester.

Established 1827.

SOLE MANUFACTURERS OF

ESSON'S PATENT COMPENSATING GAS-METERS;

KAY'S PATENT HYDRAULIC VALVE GAS-METERS;

Also, DRY METERS of the MOST APPROVED DESCRIPTION;

All of the above being Stamped under the Provisions of the SALE OF GAS ACT.

W. and B. C. likewise supply ESSON'S PATENT COMPENSATING FOUNTAINS, and KAY'S PATENT HYDRAULIC VALVES, now so extensively used for bringing ordinary Meters within the requirements of the Act of Parliament. Gas Companies can, therefore, either attach the FOUNTAINS or VALVES to their old Meters themselves, or forward them to W. and B. C. for Alteration and Stamping.

COVERNORS, STATION-METERS, PRESSURE-REGISTERS & GAUGES,

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AND ALL OTHER DESCRIPTIONS OF GAS APPARATUS.

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FOR SALE, bound in Calf, 917 pages, price £1. 11s. 6d., a few copies of Reports of Proceedings in Parliament, and elsewhere, on Matters affecting the Supply of Gas in the Metropolis, viz.: The GREAT CENTRAL GAS CONSUMERS BILL, 1850; The ARBITRATION BETWEEN MR. CROLL AND THE COMPANY, 1857; The MARYLEBONE GAS CONSUMERS COMPANY'S BILL, 1859; CITY GAS COMPANY'S BILL, Lords and Commons, 1859; and, The METROPOLIS GAS REGULATION BILL, Lords and Commons, 1860.

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MANUFACTURERS OF EVERY DESCRIPTION OF
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RETORT MOUTHPIECES, BOLTS, NUTS, &c.

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PROPRIETORS OF
BEST CLASS-HOUSE POT AND CRUCIBLE CLAY.
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AMBLECOTE FIRE CLAY AND BRICK WORKS, STOURBRIDGE.
Late in the occupation of I. and W. King. Originally J. Pidcock, Esq.
NB. A quantity of best Clay Retorts in stock, viz.—Circulars, 14 inches, 15 inches, 16 inches.
D's, 16×12, 15×14, 20×16, 16×18.

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FIRE-BRICK AND TILE MERCHANTS,
Wholesale and for Exportation,
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SOUTHWARK, LONDON, S.E.,
DEPÔT for STOURBRIDGE AND NEWCASTLE FIRE-BRICKS, LUMPS, TILES, and FIRE-CLAY, and every Article suitable for
GAS AND WATER WORKS.

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ALBERT KELLER, Ghent.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Albert Keller, of Ghent, begs to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by him. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.

Communiations, addressed to ALBERT KELLER GHENT, will receive immediate attention.

WEST and GREGSON, Gas-Meter MANUFACTURERS, &c.
UNION STREET, OLDHAM.

Station and Experimental Meters, Gas Pressure Registers, Gauges, Experimental Gasholders, Governors, Slide Valves, &c. &c.

W. and G. would respectfully call the attention of Gas Engineers and Managers to their Station-meters, having made and erected the largest in use at the present time, two of which may be seen at the Stockport and Liverpool Gas Works, on application to the respective Engineers.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

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Muirkirk Iron-Works, 1862.

LEAKAGE OF GAS-MAINS AVOIDED BY COATING WITH
YOUNG'S IRON PAINT.

This Paint has been proved, by four years test, to stand all the purposes required in Gas-Works, and has the peculiar property of drying over work previously coated with Tar.

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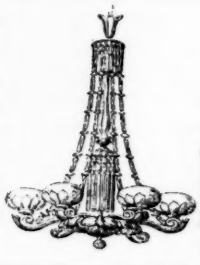

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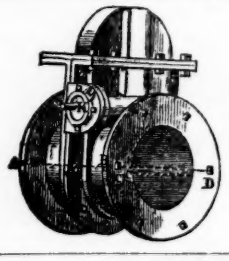

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List of prices, with full dimensions of all sizes up to 30 inches, to be had on application.

These Valves are all proved to 30 lbs. on the square inch before leaving the works, and are always kept in stock.

Valves made with Outside Racks to order. Also, Screw Water-Valves with Gun-Metal Faces.

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They are made in the most SOLID, SUBSTANTIAL manner, with PLANED and SURFACED JOINTS, and SCRAPED SURFACES. They have a CLEAR, FULL BORE, in a STRAIGHT LINE of PIPE, and are TIGHT to PERFECTION.

Engineers are requested to insert "Valves of Walkers Manufacture" in their Specifications, by which they will be absolutely certain of the above important advantages. They can name the construction of Valve they prefer best, as Walkers make them of every description—either Walkers SCREW-VALVES, for the Gas-Works or for Street-Mains; INTERNAL RACK-VALVES; or the ORDINARY RACK and PINION-VALVES. REGULATING-VALVES, with INDICATING COLUMNS, &c.

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Possess a most important practical improvement on the Stuffing-Box, effecting a large saving in a Water-Works Company's expenses. They are made with Four Gun-Metal Faces, scraped Surfaces, Gun-Metal Screws and Nuts, and are proved to three hundred pounds on the square inch.

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The PATENT GAS-REGULATOR AND PURIFIER, reduced to 6s. 6d. per dozen.

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A City, containing 150,000 inhabitants,

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Beg to inform Gas and Water Companies and the public, that they keep in stock in London all the CASTINGS in general use in Gas and Water Works, including Iron Retorts, Socket and Flange Pipes, Bends, Branches, and Syphons of all sizes, Lamp Columns, &c., &c.

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SELF-ACTING GAS GOVERNOR.

This Instrument, which is designed to replace the ordinary Governor,

Operates solely by the Action of the Gas, without any Alteration of Weights, or the Assistance of any intermediate Agency or Apparatus whatever;

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The Works are of such magnitude as to ensure the prompt execution of orders to any extent.

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GAS OVENS IN SEGMENTS OF EQUAL QUALITY.

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N.B.—*Export orders continue to have prompt attention.*

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CANNOT BE OVER OR UNDERCHARGED WITH WATER,

and they consequently register the quantity of Gas consumed with greater accuracy than Meters in which the Water-Line is variable

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Manufacturer of LOWE'S PATENT MOTIVE-POWER METER, for situations where there is an inadequacy of pressure to supply the special requirements of certain consumers in low grounds during the day or night.

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DUPLICATES of Mr. KING'S CUBIC FOOT TRANSFERRER,

similar to that manufactured by Crosley & Co., and verified by the ASTRONOMER-ROYAL, and PROFESSOR MILLER, of Cambridge, on behalf of the Government, which was deposited by them in the Office of the COMPTROLLER-GENERAL of the EXCHEQUER, before Nov. 13, 1859, in compliance with the "Act for Regulating Measures used in Sales of Gas." He also supplies

TEST GASHOLDERS,

Graduated by the Standard Cubic Foot.

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Is the only PERFECT joint that has ever been constructed, and supplies the long-felt desideratum, by allowing for the expansion and contraction of metals, and for oscillation and deflection, without impairing the joint. Gas Companies will effect an incalculable saving in adopting it, as compared with the present imperfect mode of jointing.

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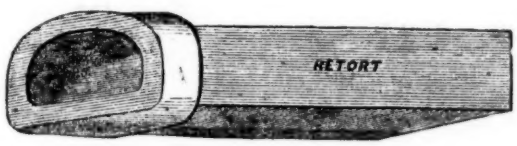

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THESE RETORTS are unrivalled in excellence, being the BEST FINISHED INTERNALLY, and THE MOST CORRECT IN FORM, of any in the Kingdom. From the peculiar composition used in working up the face of the material, they are rendered unusually smooth, close, and FREE FROM SURFACE CRACKS, thus, in a great measure, preventing leakage and the adhesion of carbon to their interior surface.

To meet the yearly increasing demand of UPWARDS OF THIRTY SEASONS and to carry out the late improvements in the manufacture, the Premises have been re-erected and much enlarged, and Engineers may rely WITH CONFIDENCE on their orders being completed with a greater regard to despatch than by any other House.

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